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Annotated keys to the genera of African Bombylioidea (Diptera: Bombyliidae; Mythicomyiidae)

by

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ABSTRACT

The genera of African Bombyliidae and Mythicomyiidae (Bombylioidea) are reviewed and new illustrated keys are provided to the families, subfamilies, tribes, genera and subgenera of Bombylioidea known from the continent of Africa and its associated islands. One new subfamily of Mythicomyiidae, Leylaiyinae Greathead and Evenhuis, for the genus *Leylaiya* Efflatoun, subfam. n. is described. Three new genera of Mythicomyiidae, *Glella* Greathead and Evenhuis gen. n., for *Glella ashleyi* Greathead and Evenhuis sp. n., *Ahessea* Greathead and Evenhuis gen. n. for *Cyrtisiopsis crassirostris* Hesse and *Reissa* Evenhuis and Báez gen. n. for *Reissa roni* Evenhuis and Báez sp. n., and one new genus of Bombyliidae, *Notolegnotus* Greathead and Evenhuis gen. n. for *Notolegnotus brevis* Greathead and Evenhuis sp. n., are described. Three new species of Mythicomyiidae are described; *Glella ashleyi* Greathead and Evenhuis sp. n. from Namibia, *Leylaiya whiteheadi* Greathead and Evenhuis sp. n. from South Africa and *Reissa roni* Evenhuis and Báez sp. n. from the Canary Islands. Six new species of Bombyliidae are described: *Notolegnotus brevis* Greathead and Evenhuis sp. n. from Namibia, *Hyperusia apiformis* Greathead and Evenhuis sp. n. from Tanzania, *Diatropomma annettae* Greathead and Evenhuis sp. n. from Tanzania, *Exoprosopa enigma* Greathead and Evenhuis sp. n. from Namibia, *Heteralonia azaniae* Greathead and Evenhuis sp. n. from Kenya and *Litorhina flammea* Greathead and Evenhuis sp. n. from Sierra Leone. A key to species of *Diatropomma* Bowden is also provided. In the Mythicomyiidae, *Euanthobates* Hesse syn. n. and *Acoecus* Hull syn. n. are synonymised with *Leylaiya* Efflatoun; and *Cyrtoides* Engel syn. n. and *Aetheoptilus* Hesse syn. n. are synonymised with *Empidideicus* Becker. The species formerly in *Euanthobates* are transferred to *Leylaiya*: *Leylaiya mellivora* (Hesse) comb. n., *L. pectinigula* (Hesse) comb. n. African species of *Cyrtosia* Perris transferred to *Cephalodromia* here include the following: *Cephalodromia albocincta* (Séguy) comb. n.; *C. bicolor* (Santos Abreu) comb. n.; *C. dumonti* (Séguy) comb. n.; *C. flava* (Séguy) comb. n.; *C. humeralis* (Santos Abreu) comb. n.; *C. nitens* (Loew) comb. n. Additionally, the Chilean species *Glabellula quebradae* Hall is transferred to *Glella* as *G. quebradae* (Hall), comb. n. and the North American *Platypygus americanus* Melander is here transferred to *Cyrtisiopsis*: *C. americanus* (Melander), comb. n. The geographical distribution of each genus is outlined and the number of species present in Africa is indicated. Where known, information is provided on hosts of the larvae.

INTRODUCTION

The most recent key to the African genera of Bombylioidea is that of Hesse (1956). Since it was written many generic concepts have changed, new species have been described and generic revisions have been carried out with the addition of new genera to the African list. There have also been a number of changes to the classification of the Bombyliidae, culminating in Yeates's (1994) phylogenetic analysis which explored previous proposals and provided new insight leading to a better supported classification. Finally, preparatory work for the recently published *World Catalog of Bee Flies* (Evenhuis & Greathead 1999) detected some new synonyms and required the removal of a few species to other genera. Here we provide a new key, including all genera known from the African continent.

Taxonomic Scope: Meigen (1820) formed the family Bombyliidae by uniting the Bombyliidae and Anthracidae of earlier authors, broadly equivalent to the divisions Homeophthalmae and Tomophthalmae of Bezzi (1924). Schiner (1868) grouped the genera known to him into four subfamilies. Becker (1913) revised the subfamilies and genera and proposed additional subfamilies to accommodate the increasing number of recognised genera, and produced the first phylogenetic tree based on his analysis of the generic characters used at that time, an arrangement followed until the 1960s. This work was built upon by Mario Bezzi, who also introduced formal subgeneric names. His classification was published in the *Bombyliidae of the Ethiopian Region* (Bezzi 1924) along with a checklist of world genera and a key to African genera and species. All these workers relied heavily on characters of the wing venation in defining their taxa.

Hesse (1938 1956) demonstrated the importance of the male genitalia of Bombyliidae in distinguishing species, but largely missed their significance as characters for the separation of genera. Mühlenberg (1971) drew attention to the importance of the female genitalia, and Theodor (1983) published a comprehensive study. Hull (1973) published the results of a world review of the family and attempted to reduce the increasing number of subfamily groups by the introduction of a tribal classification. His work was otherwise conservative in its reliance on the morphological characters favoured by Becker and Bezzi. He worked on his book over a long period without apparently rereading earlier pages, with the result that, at times, he published conflicting conclusions on different pages and even proposed different names for the same taxa. He also failed to provide formal descriptions for some of them.

Critical morphological studies leading to phylogenetic analysis were initiated by Mühlenberg (1971) who showed that the Tomophthalmae form a monophyletic group, but that the Homeophthalmae are paraphyletic. However, Rohdendorf (1964) proposed a superfamily Bombylioidea to contain Bombyliidae, Usiidae, Cyrtosiidae (= Mythicomyiidae), and Systropodidae, but did not provide an explanation of his proposal or an allocation of genera to these families. Zaitzev (1992) made morphological studies, principally on the mouthparts of the adults, and (Zaitzev 1991) accepted the superfamily concept of Rohdendorf, recognising Mythicomyiidae, Systropodidae, Phthiriidae, Usiidae and Bombyliidae, each of which he further divided into subfamilies.

Attempts were also made by other workers to develop a more satisfactory classification by incorporating features of the male and female genitalia into descriptions of supraspecific taxa. Notable among them were J. Bowden and D. J. Greathead whose conclusions, developed in discussions over several years, were used in ordering the family for the afrotropical catalogue (Bowden 1980) and the papers on the Arabian fauna (Greathead 1980*a*,*b* 1988*b*). Unfortunately, no full and formal explanation was published.

Evenhuis (1990*a*) published a phylogenetic analysis of the Usiinae and Phthiriinae in which he made proposals for re-allocation of some genera to other subfamilies. In a subsequent publication (Evenhuis 1991), he discussed the uncertainties over the limits of the family, but adopted a conservative classification incorporating his ideas. Yeates (1994) carried out a detailed phylogenetic study of the entire Bombyliidae and related families of the Asilomorpha, and proposed a deliberately conservative classification based on subfamilies within a single family, Bombyliidae. However, Yeates & Irwin

(1992) had previously shown that the Proratinae (*Caenotus* and *Prorates*) belong to the Scenopinidae. Subsequent studies led Evenhuis (1993 1994) to raise the Mythicomyiinae to family status, as the sister group to the Bombyliidae. Evenhuis & Greathead (1999) accepted the subfamily classification of Yeates (1994) for the *World Catalog of Bee Flies* with minor modification. This classification is followed here, including recognition of the family Mythicomyiidae (see also discussion below under Mythicomyiidae, p. 107).

Geographical Scope: The Afrotropical Region, as defined in the Catalogue of Afrotropical Diptera (Crosskey 1980), includes Africa south of the Sahara, Yemen, Madagascar and the smaller islands in the Atlantic and Indian Oceans. The northern boundary is arbitrary at its western (Mauritania) and eastern (Sudan) ends, and in the extent to which Arabia is included by different authors. Besides, there are species of essentially palaearctic genera present well within the Afrotropical Region; e.g. *Hemipenthes ethiopicus* Greathead in Ethiopia, *Callostoma distincta* Greathead in Somalia, *Legnotomyia striata* (Bischof) in Kenya and Tanzania.

There is also a distinctive Eremian fauna (Uvarov 1938) which straddles the boundary. This fauna is found in the Sahel, North Africa and the Arabian Peninsula, and extends eastwards into Central Asia. In the Bombyliidae, the distribution of the genus *Veribubo* indicates the extent of the Eremian Region. Some species, for example *Heteralonia megerlei* (Meigen), are present at both the northern (Southern Europe) and southern (Sahel) boundaries.

The imprecise boundary of the Afrotropical Region, discussed by Bowden (1978), is a result of the proximity of Africa to Europe since the beginning of the Tertiary Period, and to climatic changes which have affected the Sahara so that it has not always been a barrier to the spread of species into the Mediterranean Basin (reviewed in Blondel & Aronson 1999).

The concept of an exclusive boundary between the two regions led to taxonomic confusion in the past (e.g. discussed in Greathead (1967) in relation to the fauna of Eritrea), with the description of the same species under different names north and south of the boundary and an unwillingness to accept that certain genera and species can occur in both regions. Therefore, we have included all genera present on the continent of Africa.

Distribution: Several distinct centres of diversity can be distinguished in Subsaharan Africa. The most clear-cut is that of the fauna of the winter-rainfall region in the south-west. Notable endemic genera include *Pseudoglabellula* Hesse, *Ahessea* gen. n., *Mnemomyia* Bowden, *Onchopelma* Hesse and *Reissa* gen. n. among the Mythicomyiidae, and *Australoechus* Greathead, *Enica* Macquart, *Nomalonia* Rondani and *Peringueyimyia* Bigot among the Bombyliidae. The number of genera and species belonging to this fauna falls off towards the east and north, but some elements reach as far as the Somali Peninsula. This is illustrated in the Bombyliidae by the essentially African subfamily Mariobezziinae, with six genera in southern Africa, which is represented in eastern Africa by the monotypic genera *Pusilla* Paramonov in Burundi, *Zyxmyia* Bowden in northern Tanzania and south-eastern Kenya, a new species of *Hyperusia* Bezzi (described below) in the thicket vegetation around Dodoma in central Tanzania, and by the single genus *Mariobezzia* Becker in north-eastern Africa and Asia. Other southern elements, for example *Tomomyza pictipennis* Bezzi (the most northern record of this genus), are also found in central Tanzania. Maps illustrating the distribution of the genus *Australoechus* Greathead and the Mariobezziinae will be found in Greathead (2000*a*).

Elements of the palaearctic fauna are present in Ethiopia and the Somali Peninsula as noted, and penetrate as far south as south-eastern Kenya and northern Tanzania, where *Legnotomyia striata* (Bischof) is found alongside *Zyxmyia megachile* Bowden. The continuity of the arid fauna of Namibia with the Somali Peninsula was noted by Koch (1960), in relation to the Tenebrionidae of Somalia, who postulated a corridor linking them and running through Angola, Zambia, Tanzania and Kenya, represented in East Africa by the Somali and Dodoma thicket vegetation. A striking example is the new genus *Notolegnotus*, described below from Namibia, which is very close to *Legnotomyia*.

Exchange of elements between the north and south is less obvious in West Africa, but the fauna of Mauritania-Senegal-Gambia contains species suggestive of the penetration of palaearctic elements, such as *Heteralonia* (*Zygodipla*) *suavipennis* (Macquart) and *H.* (*Z.*) *mucida* François, which belong to the *H.* (*Z.*) *mucorea* (Klug) species-group with its centre of diversity in North Africa-Arabia. Interestingly, a third species, *H.* (*Z.*) *mira* Greathead (2000*a*), has recently been described from Namibia! Another exoprosopine, *Exoprosopa rutiloides* Bezzi, from Gambia is strikingly similar to its palaearctic counterpart, *E. rutila* Bezzi (François 1972).

The most extensive faunistic grouping is that of the savanna vegetation zones extending from northern and north-eastern South Africa to Ethiopia and across West Africa to Senegal. A number of species extend throughout this area, e.g. *Bombylisoma senegalense* (Macquart), *Eurycarenus dichopticus* Bezzi, *Anthrax pithecius* Fabricius, *Exoprosopa nemesis* (Fabricius) and *E. punctulata* Macquart. Others are associated with the eastern south-to-north axis and the east-to-west axis. For example, *Sisyrophanus* spp. occur along the south-to-north axis and *Exoprosopa biguttata* (Macquart) on the west-to-east axis. Within the savanna zone the mountain massifs support some characteristic elements, e.g. the *Bombylius neithokris* Jaennicke group.

Bombyliidae and Mythicomyiidae are relatively scarce in forest, but in Africa there is a distinct forest fauna in the western Congo-Guinea forest zone which extends as far east as the Kakamega Forest in Kenya, and in the eastern lowland forests which extend along the coast from Kenya to Natal, with outliers in the Eastern Cape. Forest elements in Mythicomyiidae include species of *Cephalodromia*, and in Bombyliidae include many species of *Bombylisoma*, most species of *Bombylella, Systropus* and also *Palintonus* in the west. There is a distinctive eastern coastal fauna including the *Bombylisoma gemmeus* (Bezzi) group, *Ligyra venus* (Karsch) group, and species of *Bombylella* and *Exoprosopa* which also occur outside forest.

The fauna of Madagascar is characterised by the paucity of species in most genera, but also by the diversity of species within the genus *Exoprosopa*, including several clusters of sibling species, which constitutes more than half the known species from the island; in the Mythicomyiidae, many species of *Empidideicus* await description. On the smaller islands it is notable that the most abundant and speciose genera are *Villa* and *Geron*.

History: The first comprehensive publication covering the 'bombyliid' (including Mythicomyiidae) fauna of a part of the African continent was the *Dipterenfauna Südafrika's* of Hermann Loew (1860*b*), who provided the first keys: Mario Bezzi published extensively on the African fauna. His contributions include several important regional studies, notably the *Ditteri Eritrei* (1906), a paper on the Bombyliidae of Nyasaland (Bezzi 1912), a revision of the South African Bombyliidae (Bezzi 1921*a*), and studies on the Egyptian Bombyliidae (Bezzi 1925 1926). However, by far the most important of his publications was the *Bombyliidae of the Ethiopian Region* (Bezzi 1924), which covered the fauna of the Afrotropical Region as a whole and included his conclusions on the worldwide classification of the Bombyliidae. This work remained for many years the standard on the African fauna and is still its only comprehensive work. Unfortunately, Bezzi worked on several collections at the same time, and his papers include mention of new species to be described in full elsewhere; in some instances no complete description was published, which has made the recognition of these species difficult. Notably, a paper on the Bombyliidae in the Hungarian National Museum was never published, and the specimens themselves were destroyed in a fire during the Hungarian uprising of 1956.

Bezzi's contributions were followed by the monumental work of A. J. Hesse (1938 1956) on the Southern African fauna, and subsequent supplementary papers (see references). He described each species in meticulous detail, but unfortunately this detail combined with the paucity of figures make his descriptions and keys difficult to follow. However, he was the first to systematically describe and figure the male genitalia of Bombyliidae, which were shown to be an important aid to identification in many genera and added greatly to the value of his work. Hesse's work was marred by the belief that Southern African species do not occur north of the Zambezi River, and certainly not in West Africa. He also relied on published descriptions and did not examine type material held in European museums. His attention to detail also led to an underestimation of the variability of many species and the consequent description of minor variants as varieties, subspecies or species. Consequently, he created a number of junior synonyms and names of dubious validity, many yet to be recognised (e.g. a cursory examination of type material led to the synonymisation of 51 of Hesse's taxa in the world catalog of Bombyliidae (Evenhuis & Greathead 1999).

There have been few other comprehensive regional works: Bowden (1964) published a monograph on the Bombyliidae of Ghana, François (1972) a revision of the Senegalese fauna, Greathead (1967) a study of the northern Ethiopian fauna, and Séguy (1930*a*) keys to species known to him from Morocco. H. C. Efflatoun Bey built on Bezzi's Egyptian work, but only the first part (dealing with the Homoeophthalmae) of his projected Bombyliidae of Egypt (Efflatoun 1945) was published. The work of Greathead (1980*a*,*b* 1988*b*) on the Arabian fauna is relevant, and also his checklist of Bombyliidae recorded from Namibia (Greathead 2000*a*). The Bombyliidae in the *Dipteren der paläarktischen Region* (Engel 1932–37) is the only comprehensive work for North Africa as a whole, although it is now out of date. These works should be consulted and the keys they contain used, where appropriate, as well as the publications listed in the text for those genera which have been reviewed or revised since the works of Bezzi (1924) and Hesse (1956).

The catalogues for the Afrotropical Region (Bowden 1980) and the Palaearctic Region (Zaitzev 1989) are now superseded by *The World Catalog of Bee Flies* (Evenhuis & Greathead 1999) and, in part, for the Mythicomyiidae by a catalogue of Southern African type specimens (Evenhuis 1993). A new country catalogue of the Bombyliidae of

Namibia has recently been published, which includes six new species and many species recorded from the country for the first time (Greathead 2000*a*). These publications should be referred to for the most up-to-date species lists, generic assignments and synonymies.

Hosts: All reared Bombylioidea are predators or parasitoids of arthropods. It seems likely that the ancestral state was a generalist predator in soil, and that evolution proceeded towards specialisation on particular hosts in the soil, leading to ectoparasitism and ultimately endoparasitism. The more primitive clades within the family lack the characteristic sand-chamber found in the Bombyliinae – Anthracinae and have a tubular ovipositor. The sand-chamber genera oviposit into holes or irregularities in the ground by ejecting thin-walled, sticky eggs through a chamber containing previously gathered fine sand particles adhering to dense hairs. The oviposited eggs with their covering of fine sand grains thus are protected from desiccation. The first-instar larvae are mobile and seek the host. In Toxophorinae (containing genera without a sand chamber), the eggs are thick-walled and may be placed on or near the host. Some genera among the sand-chamber subfamilies have reverted to a tubular ovipositor, having a reduced sand-chamber (*Beckerellus*) or having completely lost it (*Lepidochlanus*, *Lordotus*, *Antonia*). The host relations of the Bombylioidea in relation to their classification have been recently examined (Yeates & Greathead 1997)

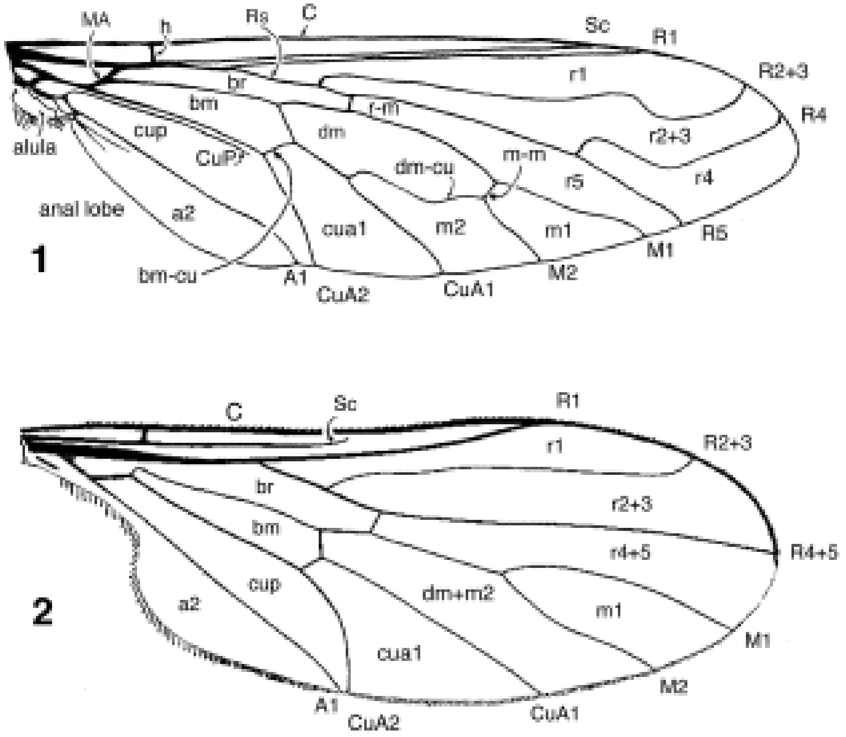
Most hosts inhabit the soil or are in close contact with it. The larvae of *Glabellula* are found in association with *Formica* spp. and those of *Heterotropus* are predatory on soil insects. A number of genera are specialised predators of egg-pods of Acridoidea, but most are ectoparasitoids on larvae and pupae – chiefly of Scarabaeoidea, Tenebrionidae, Myrmeleontidae, Noctuidae – and, above all, ground-nesting bees and wasps. Endoparasitism has developed in the Systropodini (Limacodidae), Gerontini (lepidopterous larvae in concealed situations) and Villini (larvae and pupae in soil). Above-ground hosts are attacked by Toxophorinae and Antoniinae (wasps), and some Bombyliinae and Anthracinae parasitise bees and wasps nesting in holes or constructing mud nests.

A host list was published by du Merle (1975) for all Bombylioidea and was supplemented by Yeates & Greathead (1997); see also Greathead (1963) for Acridoidea and Greathead (1980*c*) for tsetse.

CHARACTERS

Traditionally, the characters used in classifying the Bombylioidea were chiefly details of the wing venation and to a lesser extent the head and antennae. Only recently have the importance of other characters been appreciated, notably those provided by the male and female genitalia. Yeates (1994) made a detailed study of the anatomy of the internal and external skeleton, revealing many new characters of phylogenetic importance. Only those characters visible externally or revealed by dissection of the genitalia are used here. Details of other characters will be found in Yeates (1994), and a general account of dipteran morphology and explanation of terms, including recommended terminology, in McAlpine (1981); some frequently encountered alternative terminology used in keys to Bombylioidea is given in parentheses.

Head: The head of Bombylioidea is small and usually globular. In the Mythicomyiidae and more plesiomorphic subfamilies of Bombyliidae the occiput is rounded (Fig. 45),



Figs 1–2. Wings of Bombylioidea showing veins and cells. 1. Bombyliidae: *Petrorossia letho* (Wiedemann). 2. Mythicomyiidae: *Cephalodromia fusca* (Séguy). Abbreviations: a = anal cells; A = anal veins; bm = basal medial cell; bm-cu = basal portion of CuA1 (posterior crossvein); br = basal radial cell; C = costal vein; cua = cubital-anal cells; CuA = cubital anal veins; cup = anal cell; CuP = posterior branch of cubitus vein; dm = discal cell; dm-cu = discal-cubital crossvein; h = humeral crossvein; m = medial cells; m-m = medial crossvein; M = medial veins; MA = arculus; r = radial cells; R = radial veins; r-m = radial-medial crossvein; Sc = subcostal vein.

but in the more apomorphic subfamilies it is divided by a median groove behind the ocelli and is deeply concave (Fig. 46); the occipital foramen is also incompletely divided into two apertures. This character is not always easy to observe in hairy species without detaching the head – in these the head is readily detached and in dry specimens often falls off if the specimen is subjected to shock! Most genera with a deeply concave occiput also have the hind margin of the eye indented and frequently a short bisecting line extends forwards from the indentation (Figs 51, 53, 54). The frons may be smooth or with a central depression, or with a vertical or horizontal groove. The face is usually distinct as an area between the clypeus and antennae. The frons is sometimes produced and bulging above the antennae, or the frons and face are produced so the antennae arise from a prominence. The face is frequently produced, snout-like below the antennae and separated from the genae by a distinct groove (Figs 52, 53, 55).

Eyes: The eyes of many males are holoptic, or the frons is much narrower in males than females. In many genera the facets of males are enlarged in the upper part of the eye, exceptionally in *Beckerellus* the anterior facets are enlarged in the female. The ocelli are normally equally developed usually arranged in a triangle, and raised on a tubercle (ocellar tubercle) which is usually on the vertex but may be placed anterior to the vertex on the upper part of the frons.

Antennae: The antenna consists of a scape (first segment), pedicel (second segment) and flagellum consisting of one or two flagellomeres. The scape may be elongate or compact, and little longer than the pedicel which is almost always quadrate. The first flagellomere (third segment) is elongate, rod-like or swollen at the base. The second flagellomere is always small, narrow and elongate or short and vestigial. In many older descriptions the second flagellomere is referred to as a style. In fact the true style is a fine bristle-like, semi-transparent structure and may be present or occasionally absent. The style is usually terminal, but in Usiinae (Fig. 64) and Phthiriinae (Fig. 65), some Mythicomyiidae (e.g. *Glella*, Fig. 4), and some Cythereinae (e.g. *Enica*), it is subapical and rests in a concavity of the first flagellomere. In Phthiriinae the second flagellomere is also subapical and spine-like (Fig. 65).

Mouthparts: The proboscis arises from an oral cavity between the genae. It is characteristically elongate, projects beyond the face in many genera, and has narrow elongate labella (Figs 16, 22, 23, 25, 59, 60, 74–76, 86). However, in most subfamilies

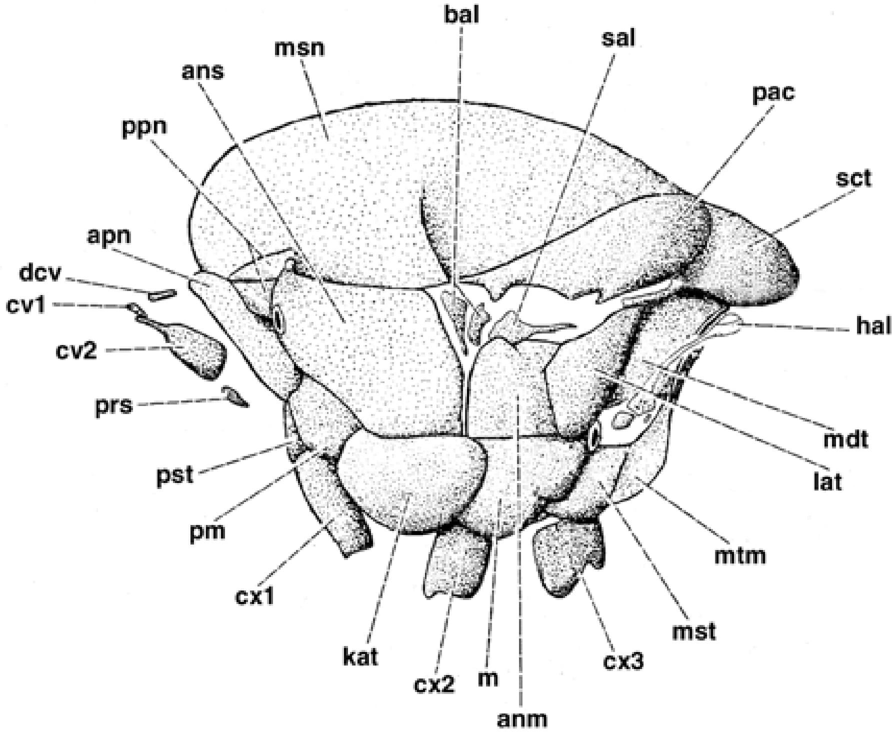


Fig. 3. Thorax of *Bombylius major* Linnaeus, showing sclerites. Abbreviations: anm = anepimeron (hypopleuron); ans = anepisternum; apn = antepronotum; bal = basalar sclerite; cv1 = first cervical sclerite; cv2 = second cervical sclerite; cx1–3 = fore, mid, and hind coxae; dcv = dorsal cervical sclerite; hal = halter; kat = katepisternum; lat = laterotergite; m = meron; mdt = mediotergite; msn = mesoscutum; mst = metepisternum; mtm = metepimeron; pac = postalar callus; pm = proepimeron; ppm = postpronotal lobe; prs = proepisternum; pst = presternum; sal = subalar sclerite; sct = scutellum

of Bombyliidae with a deeply concave occiput it is short and thick with broad fleshy labella, and may not project beyond the oral cavity (Figs 51–55). In the new genus *Notolegnotus*, *Xenoprosopa* Hesse, a few genera of Villini, and the mythicomyiid genus *Psiloderoides* Hesse the mouthparts are vestigial and non-functional. The palpi are one- or two-segmented (reduced or absent in Mythicomyiidae). Some genera of Mythicomyiidae have the proboscis retracted in various ways into or below the head (e.g. accordion-like below the head in some species of *Leylaiya* (Fig. 20); typically coiled within the head in species of *Mnemomyia*); coil-like retraction can also be found in *Apolysis corollae* Greathead.

Thorax (Fig. 3): In most genera the prothorax is vestigial and not visible from above as a distinct segment. Exceptionally, in most Platypyginae, *Toxophora*, *Paratoxophora*, etc., there is a distinct pronotum. The mesonotum is normally developed in most genera; however, it is well developed (humpbacked) in many Mythicomyiidae (especially so in *Glella* and *Empidideicus*) or remarkably flattened in others (e.g. *Mnemomyia*).

Legs: The legs are long and slender. The fore legs are often reduced in size, especially so in Exoprosopini (some genera of Bombyliidae have modified setae used in collecting pollen grains – see below under Body Colour and Vestiture). In Systropodini the hind coxae are greatly enlarged. The hind coxa of Crocidiinae and Heterotropinae bears a coxal peg on its medial surface. Pulvilli are present but frequently reduced in size or absent. In the Exoprosopini they are modified into spines which were formerly believed to be basal teeth on the claws. True basal teeth are present in a few other genera (e.g. *Efflatounia*, *Zinnomyia*). The legs usually bear bristles, including large ones at the apices of the tibiae and which articulate with it. However, rarely, Bombyliidae have retained the mid-tibial spur (*Conophorus*, Crocidiinae) which articulates with the intersegmental membrane and is semi-transparent, rather than pigmented as are the bristles. In Mythicomyiidae, the legs are unmodified (the only exceptions to this are male secondary sexual modifications of the mid or hind legs in North American species of *Mythicomyia* Coquillett).

Wings (Figs 1–2): The venation remains of considerable importance in classification, although it is recognised that some features, e.g. the presence or absence of the interradial vein, can be variable between species or even between the two wings of a single specimen. In the Mythicomyiidae and smaller-sized bombyliids the wing venation may be reduced and many veins absent in certain genera (Figs 27–38). The full complement of longitudinal veins comprises: the costa, which is usually complete but is evanescent in some taxa (e.g. Mythicomyiidae; and in Heterotropinae it only reaches the end of R_5); subcosta, which reaches the fore margin of the wing; first radial vein (first longitudinal vein), which is unbranched and ends near the apex of the wing; the radial sector (second longitudinal vein) normally divides into R_{2+3} and R_{4+5}; the median vein has two branches; the cubital vein is fused with the first anal vein (fourth longitudinal vein) and there is a second anal vein (fifth longitudinal vein). Normally cell r_1 is not divided; an interradial crossvein (anterior crossvein) may be present (three submarginal cells) or, rarely, cell r_4 may be divided by a crossvein (four submarginal cells) and open or closed and stalked; vein M_3 is always absent (four posterior cells) and M_2 absent in Toxophorinae (three posterior cells); cell cup ('anal cell') is usually open but may be closed. The basal and discal cells are normally complete, except in some 'microbombyliids'. The crossvein r-m (middle crossvein) is almost always present and its position is of importance in classification. The basicosta is often well developed and forms a costal hook (basal hook) at the root of the costa, and likewise there is often a well differentiated costal comb (basal comb) at the base of the costa itself. The alula may be broad and lobe-like, but in many genera having the wing base narrowed it is very narrow or vestigial. The squama is usually developed and rounded, with a fringe of scales or hairs. Usually, hairs or scales are absent from the wing membrane, but present in *Palintonus*.

Abdomen: The abdomen is plesiomorphically elongate and flattened, but may be long and cylindrical, or broad and short. In Systropodini the abdomen is very slender and shaped to mimic Hymenoptera. Usually, seven terga are visible, with the remainder invaginated and concealed when viewed from above.

Genitalia: The male and female genitalia have recently been shown to exhibit important characters at all taxonomic levels, although they are sometimes remarkably uniform within taxa and show little variation at the specific level (e.g. Lomatiinae). The male has a genital capsule (hypopygium) comprising a large hypandrium bearing lobe-like cerci; a pair of gonocoxae (basal part, basimere), usually fused; articulated gonostyli (beaked apical joint, telomere), absent in some Mythicomyiidae; a phallosome comprising an aedeagus which is usually sheathed and sometimes has an epiphallus which may bear dorsal outgrowths. In addition, there is a large dorso-ventrally flattened ejaculatory apodeme (basal strut), and one or two pairs of lateral apodemes (lateral struts). These structures often provide valuable specific characters and also characters for the separation of some genera. The females of the majority of subfamilies of Bombyliidae have a special modification, the sand-chamber, used in oviposition. In these subfamilies the terminal segments are invaginated to form a cavity guarded by hairs or bristles and which is filled with sand particles prior to oviposition. The sand is scraped up using strong spines borne on acanthophorites. Details of the shape of the female genitalic sclerites are of phylogenetic importance but not easily observed for routine taxonomy. However, the spermathecae are more easily viewed in cleared preparations and provide useful characters, mostly at the generic level. There are usually three spermathecae; each comprises a terminal sperm capsule or bulb that is plesiomorphically a closed tube but may be modified into a thick-walled, more or less globular chamber; this is joined to a sperm pump by a narrow duct of varying length. The sperm pump is usually a distinct structure with disk-like end plates. It is connected to a duct of varying length which joins a common duct opening into the sand-chamber. In the Mythicomyiidae and some plesiomorphic subfamilies of Bombyliidae, there is a simple tubular ovipositor, and in certain genera and the Antoniinae the sand-chamber is wholly or partly lost and appearance of the female genitalia approach the plesiomorphic state. The genital opening of females is surrounded by a structure derived from sternite 9 which may be U-shaped or divided into two and is referred to as the furca. It may provide specific characters. Uniquely, the Gerontini have a subgenital plate of uncertain homology which provides specific characters.

Body Colour and Vestiture: The bodies of Bombylioidea are usually black, sometimes with areas of paler cuticle, often variable in extent. However, some genera have clearcut pale markings (*Leylaiya*, *Empidideicus*, Systropodini, Heterotropinae, *Lomatia*), which may be sufficiently stable to be of value for separation of species. Sometimes all of the cuticle or discrete areas of it are polished and shining, but usually the body is covered in tomentum and appears dull or dusted. Exceptionally, the cuticle may be sculptured with ridges (*Pantostomus*), pits (Corsomyzini, Usiini) or foveate depressions on the abdominal terga (Heterotropinae). Bristles are present, but on the whole the positions of individual bristles do not afford useful characters. However, in some genera the presence or absence of strong bristles on the undersides of the femora is of generic or specific importance, as are the presence or absence of distinct prealar or postalar bristles. Mythicomyiidae are generally bare, but some have short, fine hairs on the thorax and abdomen (an exception to this is the generally hairy thorax found in *Psiloderoides*). However, the majority of species of Bombyliidae have hairs on the body (dense in most Bombyliinae), giving a characteristic bee-like appearance. Short, adpressed scale-like hairs may also be present beneath the long hair. These are not always clearly distinct from scales, which are also common, especially among Anthracinae. The scales may be dull or glossy, or exhibit interference colours – either metallic silver or gold or opalescent pink, blue-green, yellow-green. The pattern of the vestiture has been used to distinguish genera and species, but care is needed if these differences do not correlate with other differences, because the vestiture of many species is very variable.

A little-known character that is found in and is apparently unique to most anthophilous genera of Bombyliidae is the presence of modified fore-tarsal setae (Fig. 78). These setae characteristically have clubbed ends which aid in pollen collection. Observations by NLE have shown that pollen adheres to these hairs during feeding (especially by females) at flowers. The fly visits flowers and uses the fore legs to manipulate the anthers, thus collecting pollen on these specialised hairs of the fore tarsi. The fly then scrapes its proboscis with the forelegs, transferring pollen to the labella. Not all genera of Bombyliidae have these hairs; most genera that possess them are frequent flower visitors (e.g. these setae are found almost universally in genera of Bombyliinae). A family-wide survey is being conducted by NLE in collaboration with John Neff (Central Mellittological Institute, Texas, USA), to ascertain possible patterns among genera concerning presence, absence, and types of modified hairs. These hairs are absent in Bombyliidae with vestigial mouthparts and in all Mythicomyiidae.

FORMAT

The layout of this treatment follows the current arrangement of subfamilies and tribes, based on Yeates (1994) with modifications explained in Evenhuis & Greathead (1999). For each taxon, details of type species and generic synonymies are listed, and remarking on the identification of species within difficult taxa. When several keys exist to some or all species in Africa, the most recent is noted. A general statement on host relations is provided when information is available. The overall world distribution of each genus is indicated, and the approximate number of species known from North Africa and the Afrotropical Region is given; species are named only when there are five or less.

MATERIALS AND METHODS

Innumerable specimens have been examined from a number of institutions by both authors over more than three decades of work, which has formed a solid foundation for this study. Institutional abbreviations used in this work for material examined and depositional information: (BPBM) Bishop Museum, Honolulu, Hawaii, USA; (DJG) David J. Greathead personal collection, Wargrave, UK; (MABC) Marcos Báez personal collection, La Laguna, Canary Is.; (MZLU) Museum of Zoology, Lund University, Sweden; (NMWN) National Museum of Namibia, Windhoek, Namibia; (NMSA) Natal Museum, Pietermaritzburg, South Africa; (BMNH) The Natural History Museum, London, UK; (SAMC) South African Museum, Cape Town, South Africa. Morphological terminology used generally follows McAlpine (1981) and Yeates (1994). Abbreviations of characters used in the keys and descriptions are explained in Figs 1–3. Authorship of new taxa described in this paper is 'Greathead and Evenhuis', except for the new genus *Reissa* and its new species *R. roni*, which are attributed to Evenhuis and Marcos Báez of Universidade La Laguna, Tenerife, Canary Islands.

KEY TO FAMILIES OF BOMBYLIOIDEA AND SUBFAMILIES OF BOMBYLIIDAE PRESENT IN AFRICA

1 Wing with R_{4+5} not branched (Figs 2, 27–38); vein MA absent; palpi absent or minute; abdominal spiracles located in terga (Fig. 21); very small, 1–5 mm .... **Mythicomyiidae**

– Wing with R_{4+5} branched (Figs 1, 79–85, 87–99); vein MA present; palpi present, usually large; abdominal spiracles in pleural membrane; mostly over 5 mm .... **Bombyliidae** 2

2 Postcranium flat or tumid, without a concavity surrounding the occipital foramen (Fig. 45) 3

– Postcranium with a deep or shallow concavity surrounding occipital foramen (Fig. 46) 10

3 Wing with vein M_2 present (four posterior cells) (Fig. 1) 6

– Wing with vein M_2 absent (three posterior cells) (Fig. 79 4

4 Palpi with two segments; antenna with two flagellomeres and a subapical style (Fig. 61) .... [**Oligodraninae**] **Oligodranes** Loew

– Palpi with one segment; antenna with one flagellomere, subapical style, if present, on first flagellomere 5

5 Flagellum with a subapical sulcus containing a style (Figs 62, 64, 65) .... **Usiinae**

– Flagellum without a subapical sulcus; elongate flies sometimes mimicking Hymenoptera (Fig. 59) .... **Toxophorinae**

6 First flagellomere with an apical sulcus containing a style (Fig. 65); rather bare, narrow-bodied flies .... [**Phthiriinae**] **Phthiria** Meigen

– First flagellomere lacking an apical sulcus, style arising from second flagellomere 7

7 Hind coxal peg present; tibial spurs present on mid-tibiae; scape not swollen; abdomen elongate, narrow; up to 6 mm, usually less .... **Crocidiinae**

– Hind coxal peg absent (except *Heterotropus*); tibial spurs absent (except *Conophorus* and *Othniomyia*); scape often swollen (Fig. 63); abdomen ovate or cordate; usually over 5 mm 8

8 Cell cup almost always closed; discal cell very wide opposite r-m crossvein (Fig.

80, where, exceptionally, cup is open); body rather bare, without bristles or scales; compact flies with a pattern of dark and pale cuticle .... [**Heterotropinae**] **Heterotropus** Loew

– Cell cup usually open; discal cell not markedly widened in middle (Figs 81–82); body usually with abundant hair and/or scales, bristles well developed; broad or narrow-bodied, elongate flies 9

9 Antenna often thickened, scape usually shorter than flagellum; pronotum not distinct; body usually broad and usually densely hairy (Figs 74–76); wings normally broad and usually with well developed alula and squama; female with a well developed sand-chamber guarded by dense long hairs (except *Beckerellus*, but other characters do not differ), spermatheca with a distinct terminal bulb .... **Bombyliinae**

– Antenna elongate, rod-like, scape as long as or longer than flagellum; pronotum distinct; body very narrow and elongate (Fig. 60), bare or with scales and sparse hair only; wings very narrow and petiolate, with alula and squama reduced; female with sand-chamber small and guarded only by a row of stiff hairs on the free margin of tergum 8, spermatheca without a distinct terminal bulb .... **Ecliminae**

10 Clypeus reaching antennal sockets 11

– Clypeus not reaching antennal sockets 13

11 Eyes without an indentation on the posterior margin; scape with a ventral apical bulge (Fig. 47); wings small, shorter than body 12

– Eyes with an indentation on the posterior margin; scape cylindrical or conical, without a ventral apical bulge; wings elongate, usually longer than body .... **Lomatiinae**

12 Mouthparts elongate, labrum clothed in scales; palpi normal .... [**Oniromyiinae**] **Oniromyia** Bezzi

– Mouthparts vestigial, palpi lobed .... [**Xenoprosopinae**] **Xenoprosopa** Hesse

13 Eyes without an indentation on the posterior margin or any indication of a bisecting line (Fig. 48), and R_{2+3} always arises at an acute angle close to the origin of R_s. 14

– Eyes with an indentation on the posterior margin and at least an indication of a bisecting line (Figs 51–54); if exceptionally (some Prorostomatini) both characters are lacking, then R_{2+3} arises at right angles at a distance from origin of R_s.......... 16

14 Head much broader than high when viewed from front; antennae separated by not more than the length of scape and pedicel; scape with a short dorsal spine; body short and broad .... **Mariobezziinae**

– Head not markedly broader than high when viewed from in front or if so antennae are separated by very much more than length of flagellum; scape without a short dorsal spine; body elongate, usually narrow.. 15

15 Head with frons produced to meet face, thus forming a cone with the antennae near the apex (Fig. 48); body almost bare, with only minute hairs .... **Tomomyzinae**

– Head with frons flat or only slightly tumid; body with hair and/or small scales, bristles strong and conspicuous .... **Cythereinae**

16 Frons and face protruding and with antennae in a groove between them; body slender, abdomen elongate conical; rather bare flies with short hair and without distinct bristles, cuticle with a yellow and black pattern (Fig. 86); female without sand-

chamber and with only one spermatheca .... [**Antoniinae**] **Antonia** Loew

– Frons at most only slightly tumid, face protruding or not; body slender or broad; usually densely covered with hair and/or scales and with well developed bristles (Figs 100, 107); female with sand-chamber well differentiated and three spermathecae .... **Anthracinae**

MYTHICOMYIIDAE

Mythicomyiids are tiny flies (0.5–5.0 mm), found throughout most parts of the world except the highest altitudes and latitudes. They are not as common in the tropics, but genera such as *Cephalodromia* and *Platypygus* are known from these regions. Many of these 'microbombyliids' have humpbacked thoraces and lack the dense vestiture common in Bombyliidae. Mythicomyiids have until recently not had much attention in the literature. Their small size allows them to escape capture in Malaise traps and aerial nets with large-mesh netting. Yellow-pan trapping and fine-mesh netting have resulted in a tremendous amount of undescribed material of mythicomyiids from many parts of the world that are currently under revision by NLE. A high amount of diversity of both genera and species exists for this family in Africa, especially the northern and southern portions. This paper lists 15 genera from Africa of the known 23 genera worldwide.

Because of their extremely small size and curious body shapes, some genera have been at times placed in Acroceridae or Empididae. Melander (1902) originally placed his new subfamily Mythicomyiinae in the Empididae. Becker (1913), probably without knowledge of Melander's (1902) work, proposed the subfamily Cyrtosiinae (essentially comprising the genera in what are now considered Mythicomyiidae) and placed it in the Bombyliidae, where mythicomyiids have long been treated. Rohdendorf (1961) was the first to list the group (as Cyrtosiidae) as a family in the Bombylioidea, in his proposed classification of the Diptera; and more formally (Rohdendorf 1964) proposed raising the group to family level pending further analysis. Zaitzev (1991) was the first to give characters warranting raising the group to family level, but his lead was not followed by Yeates (1994) who, although placing the clade as the basal sister-group to the remainder of the Bombyliidae, treated the group as a subfamily of Bombyliidae. Evenhuis (1993 1994) and Evenhuis & Greathead (1999) followed Zaitzev's lead, and also here treat the group as a separate family. The family is separated from the Bombyliidae by the indentation of the inner eye margin near the level of the antennae (Fig. 18), the unbranched vein R_{4+5} (branched in Bombyliidae), the extremely reduced or absent palpi (present in Bombyliidae), wings held together over the abdomen at rest (held outstretched or at an angle in Bombyliidae), the abdominal spiracles being placed in the terga (placed in the pleural membrane in Bombyliidae), and the caudal spines of the pupa hooked at a 90° angle (these spines not recurved in Bombyliidae). Augmenting the morphological characters, it is also a much older lineage than any known Bombyliidae, dating from as far back as the Middle Jurassic (*Palaeoplatypygus* Kovalev; Callovian: 163–168 mya) with other genera known from the Cretaceous (*Procyrtosia* Hennig and *Proplatypygus* Zaitzev). Bombyliidae, on the other hand are not known from fossil material any older than Eocene Baltic amber deposits (Lutetian to Rupelian: 30–52 mya).

All the subfamilies of Mythicomyiidae are present in Africa, hence the key presented below can serve to identify subfamilies of Mythicomyiidae on a world basis.

Key to African subfamilies of Mythicomyiidae

1 Wing vein R_{4+5} ending in costa at a level slightly beyond, at, or before end of vein M_2 (Figs 27, 28, 30, 32) 2

– Wing vein R_{4+5} ending in costa at a level clearly well beyond end of vein M_2 (Figs 31, 35, 38) 3

2 Veins R_{4+5} and M_1 converging or parallel at wing margin (Fig. 27); costa ends at or near vein M_1.......... **Leylaiyinae** Greathead and Evenhuis, subfam. n.

– Veins R_{4+5} and M_1 diverging at wing margin (Figs 29, 30); costa ends at or near vein R_{4+5} .... **Glabellulinae**

3 Wing with vein R_{2+3} absent (Fig. 36); spermathecae spherical with an apical invagination (Fig. 41) .... **Empidideicinae**

– Wing with vein R_{2+3} present, spermathecae shaped otherwise 4

4 Vein R_{2+3} ending in R_1, at or before junction with costa forming a small triangular cell r_1 (Fig. 31) 5

– Vein R_{2+3} ending in costa well separated from R_1 (Figs 26, 35, 37, 38), cell r_1 not a small triangle; antennal style placed apically on second flagellomere or not evident (Figs 6–7, 15) 6

5. Antennal style placed subapically on second flagellomere (Fig. 4) ....
[**Mythicomyiinae**] **Reissa** Evenhuis and Báez, gen. n.

– Antennal style placed apically on second flagellomere ....
[unplaced to subfamily] **Hesychastes** Evenhuis

6 Vein R_{2+3} short, much shorter than R_{4+5} (Fig. 26) .... **Psiloderoidinae**

– Vein R_{2+3} long, similar in length to R_{4+5} (Figs 35, 37, 38) .... **Platypyginae**

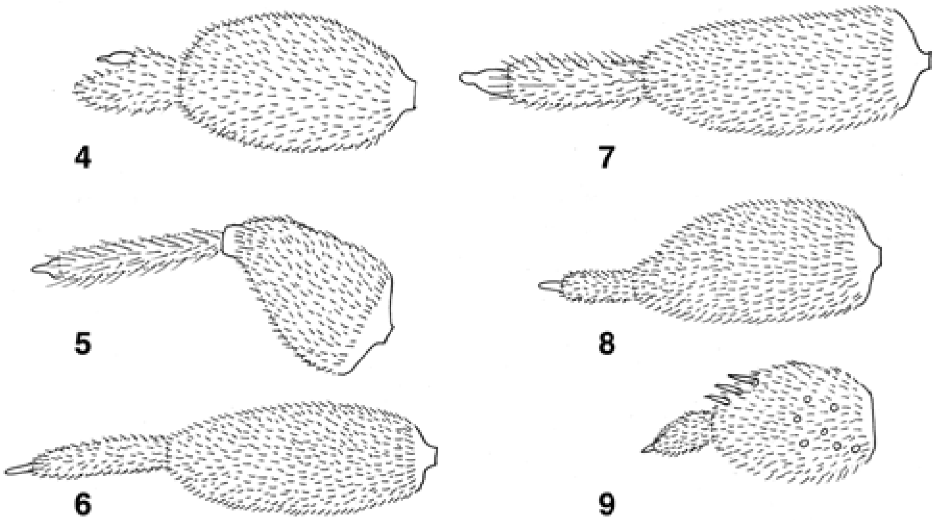
Glabellulinae Cockerell

Type genus: *Glabellula* Bezzi, 1902.

The Glabellulinae was originally erected by Cockerell (1914) to include only the genus *Glabellula* Bezzi. We here add *Doliopteryx* Hesse, *Mnemomyia* Bowden, and the new genus *Glella*. The subfamily is defined by the wing vein R_{4+5} ending in the wing margin at a level near the end of M_2 and veins R_{4+5} and M_1 are diverging at the wing margin. The subfamily is of zoogeographical interest as it is a fairly old lineage (amber fossils of *Glabellula* are known from Eocene Baltic and Oligocene/Miocene Dominican amber) and most of its constituent genera show evidence of disjunct distributions: *Glella* gen. n. is known from two species (one from Chile; one from Namibia); *Doliopteryx* is found in southwestern Africa and northeastern Africa and Arabia; *Glabellula* is worldwide in distribution, but only known in Africa from a few specimens in South Africa, Botswana, and Namibia and another species recorded from Egypt.

Key to genera of Glabellulinae

1 Wing with vein R_{2+3} ending in R_1 forming a small triangular cell r_1 (Figs 29, 30, 32); clypeus normal, not well developed; proboscis not coiled within head.......... 2



Figs 4–9. Mythicomyiidae antennae. 4. *Glella ashleyi*, Greathead and Evenhuis sp. n. 5. *Empidideicus basutoensis* Hesse. 6. *Cyrtisiopsis singularis* Séguy. 7. *Cephalodromia flava* (Séguy). 8. *Cyrtosia marginata* Séguy. 9. *Glabellula natalensis* Hesse.

– Wing with R_{2+3} absent; clypeus large, rounded (Fig. 17); proboscis coiled within head .... **Mnemomyia** Bowden

2 Vein M_1 with basal portion evanescent or absent (Fig. 32); all cells between M_2 and CuA_2 confluent .... **Doliopteryx** Hesse

– Vein M_1 complete; cell bm united with discal cell 3

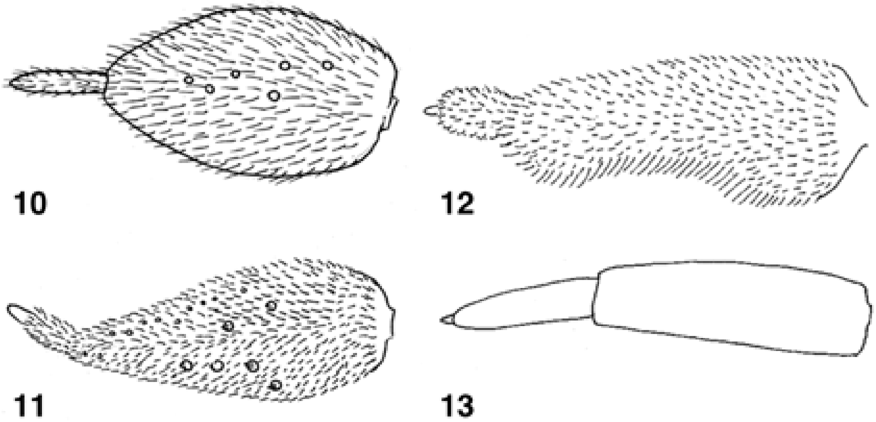
3 Abdominal tergum 2 with sclerotisation complete, not interrupted medially. Antenna with style placed subapically on the second antennal flagellomere (Fig. 4); first antennal flagellomere width half to third its length, ovate ....
Glella Greathead and Evenhuis, gen. n.

– Abdominal tergum 2 with sclerotisation interrupted medially (Fig. 19). Style of antenna placed apically on second antennal flagellomere or not evident; first antennal flagellomere width subequal to its length, often rounded (Fig. 9) ....
Glabellula Bezzi

Mnemomyia Bowden

Mnemomyia Bowden, 1975*b*: 308. Type species: *Mnemomyia rostrata* Bowden, 1975, by original designation.

Comments: Bowden (1975*b*) created this genus to comprise his new species *Mnemomyia rostrata* and another species, previously described in *Glabellula* and placed subsequently in *Empidideicus*, namely *Mnemomyia mellea* (Bezzi). The genus is an unusual one, and is characterised by the prominent bulging clypeus and flattened mesonotum. Bowden (1975*b*) expressed concern that it was even a bombyliid due to its anomalous characters. It does not fit well in the Glabellulinae, and further research may show it to belong elsewhere. Previously known from only two specimens representing two species, recent collecting has resulted in thousands of specimens representing many new species, particularly from Namibia. The genus is apparently indigenous to Namibia and western South Africa.



Figs 10–13. Mythicomyiidae antennae. 10. *Doliopteryx tigrina* Evenhuis. 11. *Mnemomyia rostrata* Bowden. 12. *Ahessea crassirostris* (Hesse). 13. *Onchopelma pulchellum* Hesse.

Distribution: Namibia, South Africa: 2 species; *Mnemomyia mellea* (Bezzi), *M. rostrata* Bowden.

Doliopteryx Hesse

Doliopteryx Hesse, 1938: 39, 968. *Nomen nudum.*
Doliopteryx Melander, 1946: 454. *Nomen nudum.*
Doliopteryx Hesse, 1956: 15. *Nomen nudum.*
Doliopteryx Hesse, 1956: 936. Type species: *Doliopteryx crocea* Hesse, 1956, by original designation.

Comments: Originally, *Doliopteryx* was only known from four specimens representing two species. Recent concentrated collecting by pan and Malaise trapping (examined in the revision by Evenhuis (2000)) has resulted in thousands of specimens representing twelve species from the Middle East, Egypt, Namibia, South Africa, and Zimbabwe.

Key: Evenhuis (2000).

Distribution: Egypt: 1 species; *Doliopteryx palaestinensis* Evenhuis & Theodor. Southern Africa: 10 species.

Glella Greathead and Evenhuis **gen. n.**

Type species: *Glabellula quebradae* Hall, 1976, by present designation.

Etymology: An arbitrary combination of letters. Gender feminine.

Diagnosis: *Glella* fits in the group of genera in Glabellulinae that have a small triangular cell r_1 and confluent wing cells dm and bm, but can be easily distinguished from them by the subapical placement of the style on the second antennal flagellomere. The description below of the new species, *Glella ashleyi,* can serve to further characterise the genus.

Comments: Two species are contained in this genus: one from Chile – *Glella quebradae* (Hall); the other from Namibia – *Glella ashleyi* sp. n., which shows a disjunct distribution of the genus. It is a very rare genus, known only from a handful of specimens of each species.

Distribution: Namibia: 1 species; *Glella ashleyi* sp. n. Chile: 1 species; *Glella quebradae* (Hall), comb. n.

Glella ashleyi Greathead and Evenhuis **sp. n.**

(Figs 4, 29, 42)

Etymology: The species is named for Ashley Kirk-Spriggs, who collected and made available many interesting specimens of Mythicomyiidae from Namibia, and made life difficult for one of us (NLE), who has to go through tens of thousands of his alcohol-preserved specimens of microbombyliids, measuring sometimes no more than 1 or 2 mm.

Material examined: Holotype ♂ (NMNW) and 5♂5♀ paratypes from NAMIBIA: Lüderitz District: Rooiberg mountain, 27°38'S 16°28'E, 22–24.ix.1997, A. H. Kirk-Spriggs & E. Marais, Malaise trap sample; 1♂1♀, Obib waters at 28°00'08"S 16°38'46"E, 10–26.viii.1998, A. H. Kirk-Spriggs & E. Marais, Malaise traps sample. Paratypes: NAMIBIA: 1♂, Lüderitz District: Skorpion area, 27°49'S 16°36'E, 9–12.viii.1997, E. Marais & A. H. Kirk-Spriggs, Malaise trap; 1♂, dolomitic hill at: 27°22'30"S 16°19'34"E, 23–25.ix.1997, E. Marais & A. H. Kirk-Spriggs, Malaise trap. 2♂, 8 km W. Rosh Pinah, 27°59'28"S 16°39'14"E, 10–26.viii.1998, A. H. Kirk-Spriggs & E. Marais, Malaise trap. All deposited in NMNW. Holotype and paratypes preserved in alcohol.

Diagnosis: This species can be separated from *Glella quebradae*, the only other known species of *Glella,* by the normally shaped occiput (occiput developed posteriorly in *quebradae*), the more humpbacked mesonotum (less so in *quebradae*), and the virtually all brown thorax and abdomen (with broad yellow markings in *quebradae*).

Description: ♂♀. Length: 0.98–1.06 mm. *Head*: Occiput black; eyes dichoptic, separated at vertex by slightly more than distance between lateral ocelli (i.e. lateral ocelli widely separated); frons depressed medially, brown, yellow just above antennae; face brown, tip of oral margin slightly darker brown; antennae brown to black; scape minute, black; pedicel cylindrical, black, slightly wider than long; first flagellomere (Fig. 4) brown, black dorsally, ovoid, length about 1.5 x greatest width; second flagellomere about third length of first, with subapical style; venter of head reduced, oral margin nearly meeting ventral portion of occiput, area between oral margin and occiput pale brown; proboscis brown, length slightly longer than oral margin; labrum sclerotised, stiff, pointed apically, length slightly less than height of oral margin; palpus not evident. *Thorax*: Brown, mesonotum with barely perceptible darker brown admedian vittae extending from dark brown subtrapezoidal prescutellar area to just anterior of prealar suture, with minute scattered dark hairs; humeral callus and postalar callus thinly yellow; coxae brown; femora pale brown; tibiae and tarsi yellowish; halter stem brown, knob white. *Wing* (Fig. 29): Hyaline; veins pale brown to yellowish; costa ends just beyond end of vein R_{4+5}; vein Sc incomplete, ending at level about halfway between origin of Rs and end of vein R_{2+3}; Rs evanescent at connection with R_1; R_{4+5} slightly curved to wing margin; vein M_1 curved toward wing margin; crossvein dm-cu closing discal cell present; crossvein r-m at middle of discal cell; vein closing cell m_2 arched; A_1 straight to wing margin; short fringe of hair on posterior margin of wing. *Abdomen*: Dorsum dark brown, with scattered dark hairs; yellow laterally on terga 1–4; venter brown. Female genitalia with spermatheca as in Fig. 42.

Glabellula Bezzi

Platygaster Zetterstedt, 1838: 574. Type species: *Platygaster arcticus* Zetterstedt, 1838, by monotypy. [Preoccupied by Latreille, 1809.]

Sphaerogaster Zetterstedt, 1842: 232 (new replacement name for *Platygaster* Zetterstedt, 1838). Type species: *Platygaster arcticus* Zetterstedt, 1838, automatic. [Preoccupied by Sturm, 1826.]

Glabella Loew, 1873: 210. Type species: *Glabella femorata* Loew, 1873, by monotypy. [Preoccupied by Swainson, 1840.]

Glabellula Bezzi, 1902: 191 (new replacement name for '*Platygaster* . und *Sphaerogaster* . und *Glabella*'). Type species: *Platygaster arcticus* Zetterstedt, 1838, by subsequent designation (I.C.Z.N., 1989: 148).

Pachyneres Greene, 1924: 62. Type species: *Pachyneres crassicornis* Greene, 1924, by monotypy.

Proglabellula Hennig, 1966: 15. Type species: *Proglabellula electrica* Hennig, 1966 [= *Platygaster arcticus* Zetterstedt, 1838], by monotypy.

Comments: *Glabellula* is currently undergoing a world revision by NLE. Over 20 new species are being described, which will result in a total of over 40 species worldwide. The genus is virtually cosmopolitan, but localised in its range. It is found in North and South America, Europe, Asia, Africa, and Australia. It has not yet been recorded from the Oriental Region.

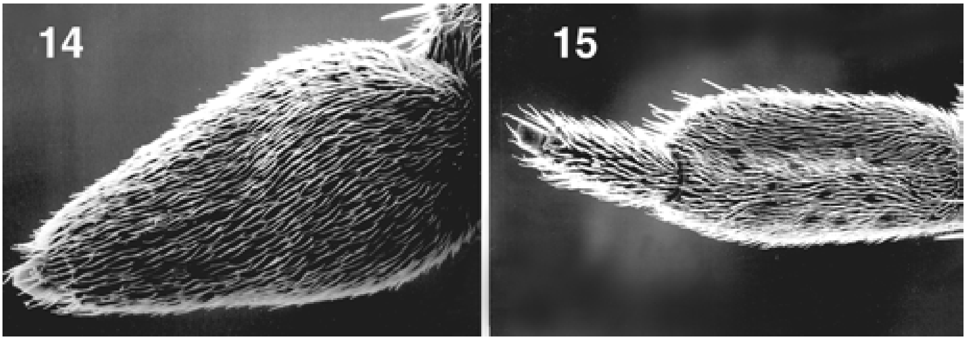
Hosts: Immatures of the genus have been recorded from the nests of *Formica* spp. in Europe (Andersson 1974) and have been surmised as possibly being predaceous or free living.

Distribution: Egypt: 1 species; ?*Glabellula femorata* (Loew). Botswana, South Africa, Namibia: 1 species; *Glabellula natalensis* Hesse.

Leylaiyinae Greathead and Evenhuis **subfam. n.**

Type genus: *Leylaiya* Efflatoun, 1945, by present designation.

Current members of this subfamily were previously placed by Hull (1973) in the Glabellulini (*Pseudoglabellula*) and Empidideicini (*Leylaiya*), based primarily on the presence or absence of a small triangular cell r_1. The formation and shape of the cell r_1 is actually different in these cases and as such is not considered homoplastic. The subfamily is distinguished from other subfamilies of Mythicomyiidae by the wing veins R_{4+5} and M_1 subparallel at the wing margin. Two other generic names placed in this subfamily are *Euanthobates* Hesse and *Acoecus* Hull, which are found to be junior synonyms of *Leylaiya* in this study.



Figs 14–15. Mythicomyiidae antennae, scanning electron micrographs. 14. *Leylaiya mimnermia* Efflatoun. 15. *Platypygus natalensis* Hesse.

Key to genera of Leyaiyinae

1 Wing with vein R_{2+3} present, ending in R_1 before costa making small triangular marginal cell (Figs 23, 33); antenna without evident second flagellomer .... **Pseudoglabellula** Hesse

– Vein R_{2+3} absent, no marginal cell; antenna with small second flagellomere (Fig. 14) .... **Leylaiya** Efflatoun

Leylaiya Efflatoun

Leylaiya Efflatoun, 1945: 21. Type species: *Leylaiya mimnermia* Efflatoun, 1945, by original designation.

Euanthobates Hesse, 1965: 482. Type species: *Euanthobates pectinigulus* Hesse, 1965, by original designation. **Syn. n.**

Acoecus Hull, 1973: 265, 276 (as subgenus of *Euanthobates* Hesse). Type species: *Euanthobates mellivorus* Hesse, 1967, by original designation. **Syn. n.**

Comments: Examination in this study of the genera *Euanthobates*, *Acoecus*, and *Leylaiya* show them to be congeneric. Hull (1973) distinguished his subgenus *Acoecus* from *Euanthobates s. str.* by the unmodified venter of the head (the venter in *Euanthobates pectinigulus* had 'caeca-like' protuberances according to Hesse). Close examination of the type specimen of *E. pectinigulus*, as well as other specimens, show that Hesse misinterpreted these 'protuberances'. They are, in fact, part of the proboscis, which retracts into the open oral cavity of the venter of the head in an accordion-like fashion (see Fig. 20). Hesse and Hull apparently did not know *Leylaiya* (the latter merely quoted Efflatoun's description in his 1973 work). Direct comparison of many specimens of *Leylaiya*, *Euanthobates*, and *Acoecus* shows that head, antennal, and wing venation characters are all within a very small range of variation; and the proboscis modifications are only a specific, not a generic character. Hence, we here place *Euanthobates* and *Acoecus* as junior synonyms of *Leylaiya*. In South Africa, some species are pollinators of Mesembryanthemaceae (*Leylaiya whiteheadi* on *Conophytum pellucidum*; Liede *et al.* (1991) and see below).

Distribution: Egypt: 1 species; *Leylaiya mimnermia* Efflatoun. Namibia, South Africa: 3 species; *Leylaiya mellivora* (Hesse) comb. n., *L. pectinigula* (Hesse) comb. n., *L. whiteheadi* sp. n.

Leylaiya whiteheadi Greathead and Evenhuis **sp. n.**

(Figs 20, 24, 27)

Etymology: Named for Dr. Vin Whitehead of the South African Museum, who brought the specimens below to NLE's attention and was a kind and generous host during his visit to South Africa.

Material examined: Holotype ♀ and 2♀ paratypes from SOUTH AFRICA: *Northern Cape*: Boesmanland: Rietfontein, Rotnaarskoker, 2918Cc, 16.iv.1989, S[igrid] Liede. The holotype lacks the left antenna beyond the scape and the right wing is torn off at the base and missing. Holotype in SAMC. Paratypes in SAMC and BPBM.

Diagnosis: This species is easily separated from the other three known species in this genus by the characteristic black and white pattern of the thorax and abdomen (Fig. 24).

Description: ♀. *Length*: 1.78–2.06 mm. *Head* (Figs 24*a*,*b*): Black with white to yellow patterning; occiput black with white posterolaterally; eyes dichoptic, separated at vertex by

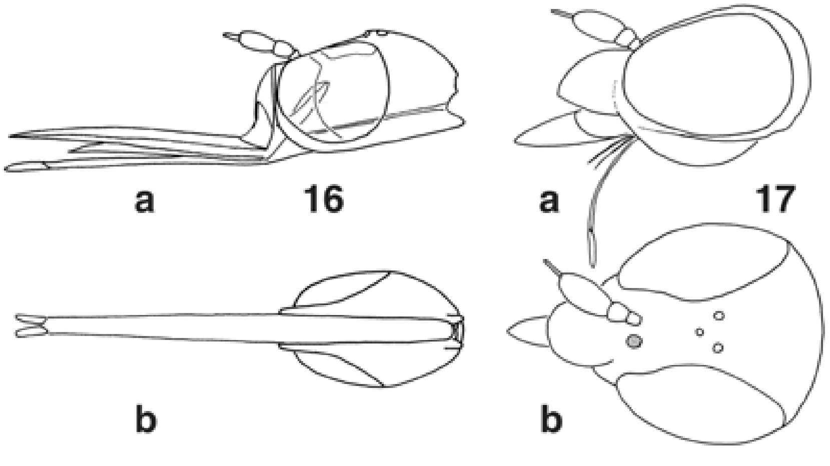
3 x distance between lateral ocelli; frons black, narrow white patch laterally adjacent to inner eye margin, thin white line above antennae; face yellow, tip of oral margin black; antennae black; scape cylindrical; pedicel subconical, slightly wider than long; first flagellomere lanceolate, length about 2 x greatest width; second flagellomere minute, with microscopic apical style; venter of head black; proboscis thin, strap-like, extremely long when extended (more than body length), accordion-like when retracted in oral groove below head (Fig. 20); labrum sclerotised, stiff, pointed apically, length slightly less than height of oral margin; palpus not evident. *Thorax* (Figs 24*a*,*b*): Mesonotum dark brown to black dorsally with patterning, with scattered dark hairs; scutellum yellow with narrow blackish median line; coxae black; femora black basally, yellowish apically; tibiae and tarsi yellowish; halter stem and knob yellowish white. *Wing* (cf. Fig. 27): Hyaline; veins dark brown; costa ends at end of vein M_1; vein Sc complete; base of Rs connected to vein R_1; R_{4+5} slightly curved to wing margin; vein M_1 curved toward wing margin, converging with vein R_{4+5} at wing margin resulting in narrow cell r_5, width less than crossvein r-m; A_1 straight to wing margin; fringe of hair on posterior margin of wing. *Abdomen* (Fig. 24*b*): Dorsum with black and yellow patterning; venter sclerotised black.

Remarks: Little is known of the biology of this species. Liede *et al*. (1991) recorded the type series as visiting flowers of *Conophytum pellucidum* in northern Cape. The flower species has a comparatively long tubular corolla, which would apparently necessitate the *Leylaiya* adults to extend the proboscis to its full length in order to reach nectar.

Pseudoglabellula Hesse

Pseudoglabellula Hesse, 1967: 118. Type species: *Pseudoglabellula meridionalis* Hesse, 1967, by original designation.

Comments: Originally based on a single specimen from South Africa. Material of numerous males and females from recent Malaise and pan trapping have been examined from Namibia. It is still an uncommon genus, but not nearly as rare as originally thought.
Distribution: Monotypic. Namibia, South Africa: *Pseudoglabellula meridionalis* Hesse.



Figs 16–17. Mythicomyiidae heads, diagrammatic. 16. *Cephalodromia fusca* (Séguy), *a*. lateral, *b*. ventral. 17. *Mnemomyia rostrata* Bowden. *a*. lateral. *b*. dorsal.

Empidideicinae Hull

Type genus: *Empidideicus* Becker, 1907.

Hull (1973) proposed this group (as Empidideicini) to include the genera *Empidideicus* Becker (including the subgenus *Cyrtoides* Engel), *Anomaloptilus* Hesse, *Euanthobates* Hesse, and *Leylaiya* Efflatoun. Further investigation of all of these genera show that *Euanthobates* and *Leylaiya* are themselves congeneric and belong in a separate subfamily, the Leylaiyinae (see above). The Empidideicinae are distinguished by the absence of vein R_{2+3}, the relatively long second antennal flagellomere (Fig. 5) (about as long as the first segment) and the spermathecae with an apical invagination (Fig. 41).

Empidideicus Becker

Empidideicus Becker, 1907*a*: 97. Type species: *Empidideicus carthaginiensis* Becker, 1907, by monotypy.

Cyrtoides Engel, 1933: 102 (as subgenus of *Empidideicus* Becker). Type species: *Empidideicus efflatouni* Engel, 1933, by monotypy. **Syn. n.**

Ecliptica Engel, 1933: 103. Unavailable name; name proposed in synonymy with *Cyrtoides* and not made available before 1961.

Anomaloptilus Hesse, 1938: 983 (as subgenus of *Empidideicus* Becker). Type species: *Empidideicus celluliferus* Hesse, 1938, by monotypy.

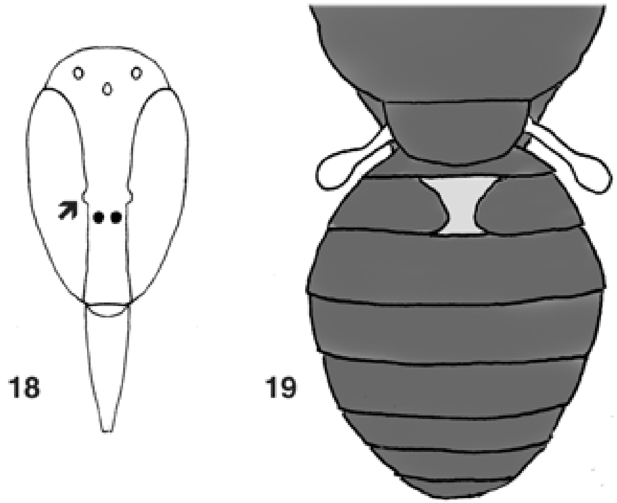
Aetheoptilus Hesse, 1967: 112 (as subgenus of *Empidideicus* Becker). Type species: *Empidideicus zuluensis* Hesse, 1967, by original designation. **Syn. n.**

Comments: This genus is predominantly Old World, with high diversity in southern Africa and Arabia. Many undescribed forms are known from these areas, as well as Madagascar, India, Pakistan, Sri Lanka, Flores Island (Indonesia), and the Kimberley Range of northern Australia. After revisionary work on this genus is completed, it is estimated that the number of species could easily triple or possibly quadruple. Currently 20 species of this genus are known worldwide.

Cyrtoides was originally proposed by Engel (1933) as a subgenus of *Empidideicus*, then later elevated to generic rank by Brues *et al.* (1954). Examination of numerous individuals of the type species, *Empidideicus efflatouni*, shows that all three ocelli being in a straight line (transversely on the vertex) varies among individuals in different populations and is not of generic value, thus *Cyrtoides* is here placed as a junior synonym of *Empidideicus*. The subgenus *Aetheoptilus* was created by Hesse for an anomalous species that he interpreted as possessing a small triangular cell r_1 as in *Mythicomyia*. Close examination shows that there is only a darker infuscation in this area (see Figs 22, 34) and is not a true vein R_{2+3}. The spermathecae and other salient characters are typical of *Empidideicus*, hence *Aetheoptilus* is here treated as a junior synonym of *Empidideicus*. *Anomaloptilus* was previously synonymised with *Empidideicus* by Bowden (1980). The presence (typical of *Anomaloptilus*) or absence (typical of *Empidideicus*) of the vein closing the discal cell apically is merely a specific and not a generic character and is subject to variability, even among series of specimens of the same species.

Key: Efflatoun (1945) for Egypt; Hesse (1967) for southern Africa.

Distribution: Cape Verde Islands, Canary Islands, Northern Africa: 7 species. Southern Africa: 6 species.



Figs 18–19. Mythicomyiidae external characters. 18. *Cyrtosia obscuripes* Loew, head, dorsal, showing inner eye indentation (arrow). 19. *Glabellula* sp., diagrammatic view of abdomen, dorsal, showing interruption of sclerotisation on tergum 2.

Mythicomyiinae Melander

Type genus: *Mythicomyia* Coquillett, 1893.

As currently constituted, this subfamily contains the genera *Mythicomyia* Coquillett, *Mythenteles* Hall & Evenhuis, and *Reissa* Evenhuis & Báez gen. n. It is the most diverse in terms of species of any of the subfamilies, due in large part to the speciose New World genus *Mythicomyia*, which contains 169 described species and an estimated 150–200 additional undescribed species. The subfamily is characterised by the small triangular cell r_1 and the subapical placement of the antennal style.

Reissa Evenhuis & Báez **gen. n.**

Type species: *Reissa roni* Evenhuis & Báez sp. n., by present designation.

Etymology: Named in memory of the late chironomid specialist, Friedrich Reiss. Gender feminine.

Diagnosis: This genus has some wing characters that are reminiscent of some Glabellulinae (e.g. small triangular cell r_1) but it can be separated from them by the longer vein R_{4+5} (vein R_{4+5} ends in the costa before the level of M_2 in Glabellulinae). Within the subfamily Mythicomyiinae, it is similar to the genus *Mythenteles* Hall and Evenhuis (which occurs in nearby Spain), but can be easily separated from it by the absence of vein A_1 and the small discal cell.

Distribution: Extant species known only from the Canary Islands. An undescribed second species from Eocene/Oligocene Baltic amber is in the personal collection of NLE and will be described elsewhere.

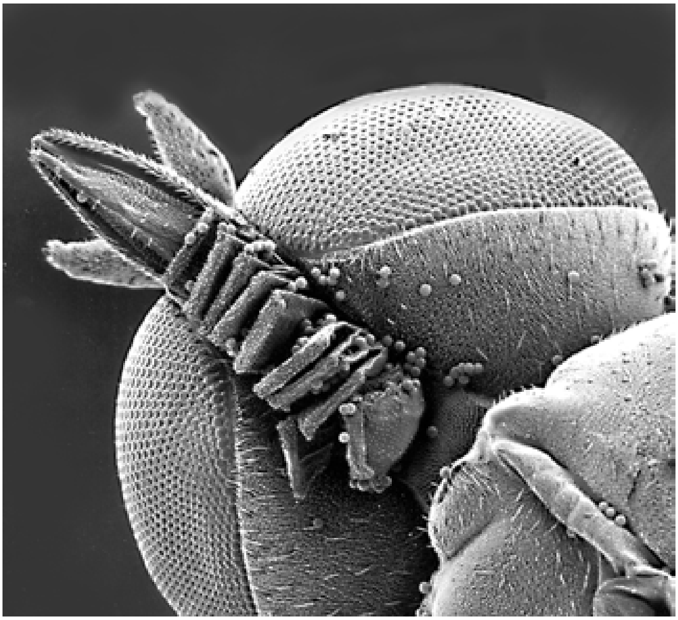


Fig. 20. *Leylaiya whiteheadi* Greathead and Evenhuis, scanning electron micrograph, ventral view, showing accordion-like retracted proboscis.

Reissa roni Evenhuis & Báez **sp. n.**

(Figs 31, 39)

Etymology: The species is named for Ronald Englund, friend and colleague of NLE, and who has contributed much rare and interesting Diptera material through his extensive collecting activities.

Material examined: Holotype ♂ and 1♂4♀ from SPAIN: Canary Is: Tenerife I: Las Cañadas, 12.iv.84, M. Báez. Holotype in MABC; paratypes in MABC and BPBM.

Description: ♂♀. Length: 0.98–1.06 mm. *Head*: Black; occiput black, yellow laterally; postgena yellow; eyes dichoptic, separated at vertex by slightly more than distance between lateral ocelli; frons depressed medially, yellow to yellow-white; face yellowish, tip of oral margin brown; antennae black; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere ovoid, length about 1.5 x greatest width; second flagellomere about third length of first, with subapical style; venter of head yellowish, shiny; proboscis dark brown, length slightly longer than head height; labrum sclerotised, stiff, pointed apically, length slightly less than height of oral margin; palpus not evident. *Thorax*: Mesonotum and scutellum subshining dark brown to black, with scattered dark hairs; humeral callus, thin notopleural line to wing base and thin ridge along postalar callus yellow; coxae and legs brown, trochanters and apices of femora yellowish; halter stem brown, knob yellow. *Wing* (Fig. 31): Hyaline; veins brown; costa extends completely around wing, as thin vein beyond end of vein R_{4+5}; vein Sc incomplete, ending at level just beyond origin of Rs; Rs evanescent at connection with R_1; R_{4+5} straight to wing margin, not curved; vein separating cells br and bm evanescent; vein M_1 slightly curved toward wing margin; M_2 fairly straight to wing margin; crossvein dm-cu closing discal cell present; discal cell short, subequal in width and height; vein A_1 evanescent; sparse fringe of hair on posterior margin of wing rather long. *Abdomen*: Dorsum dark brown, with scattered dark hairs, pale brown posteriorly on terga 3–6; venter brown. *Male genitalia* (Fig. 39): Gonocoxae extremely reduced in size, gonostyli absent, gonocoxal apodemes present, extending below epiphallus to level of middle of aedeagal apodeme; epiphallus with extremely long, thin aedeagal tube, recurved upon itself at base; aedeagal tip bifid; aedeagal apodeme axe-shaped in lateral view; epandrium subrectangular, with large cerci that extend below and above epandrium, posterodorsal corner of epandrium (Fig. 39*c*) with sharply pointed inner projection, surstylus-like. Female genitalia not dissected.

Psiloderoidinae Hull

Type genus: *Psiloderoides* Hesse, 1967.

Interestingly, when Hull (1973) proposed this grouping (as Psiloderoidini) within the subfamily Platypyginae, he included *Psiloderoides* and the Australian genus *Cyrtomorpha* White [the latter name preoccupied; = *Acridophagus* Evenhuis], but placed *Onchopelma* in the Cyrtosiini. This subfamily is characterised by the short R_{2+3}, much shorter than R_{4+5}. The Jurassic fossil *Palaeoplatypygus* Kovalev and the Cretaceous fossil genera *Procyrtosia* Zaitzev and *Proplatypygus* Hennig belong here, which makes Psiloderoidinae the oldest lineage in the Mythicomyiidae – and corroborates the findings of Yeates (1994), who examined Australian specimens of the genus *Acridophagus* and related taxa in his cladistic study and claimed them to be the most plesiomorphic of his 'Mythicomyiinae'.

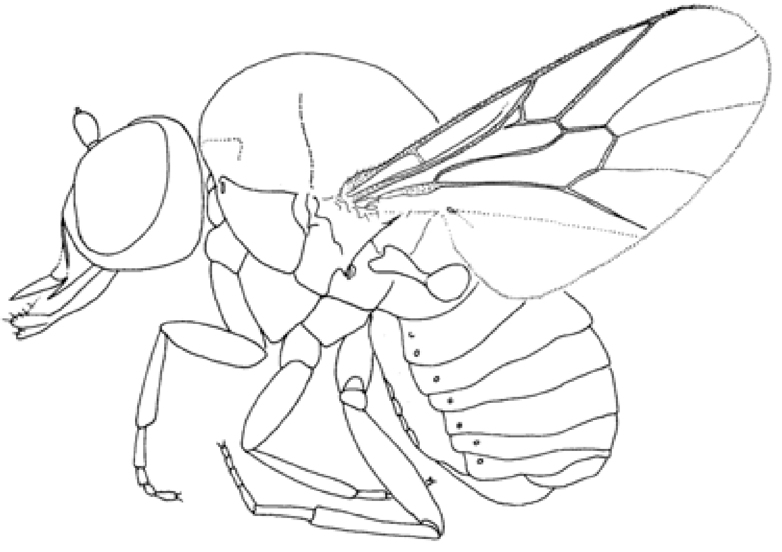


Fig. 21. *Glabellula natalensis* Hesse, female habitus, lateral.

Key to genera of Psiloderoidinae

1 Proboscis much reduced, non-functional; habitus acrocerid-like (Fig. 26); head small, rounded; second antennal flagellomere much shorter than first segment; sexually dimorphic with females much large than males ...... **Psiloderoides** Hesse

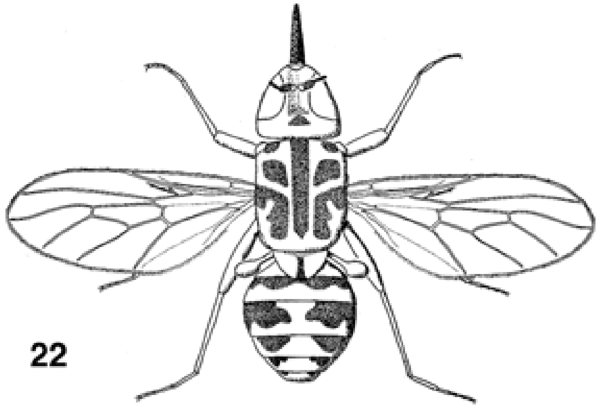
– Proboscis tubular, not reduced; habitus not acrocerid-like; head not disproportionally small compared to thorax and abdomen; second antennal flagellomere three quarters size to equal in length to first flagellomere (Fig. 13); not sexually dimorphic .... **Onchopelma** Hesse

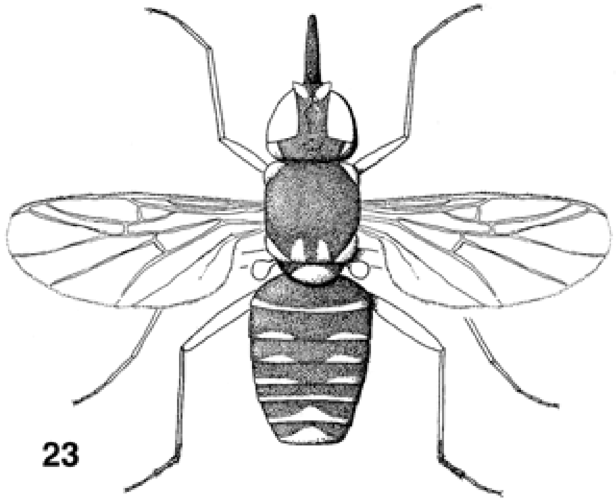
Psiloderoides Hesse

Psiloderoides Hesse, 1967: 121. Type species: *Psiloderoides mansfieldi* Hesse, 1967, by original designation.

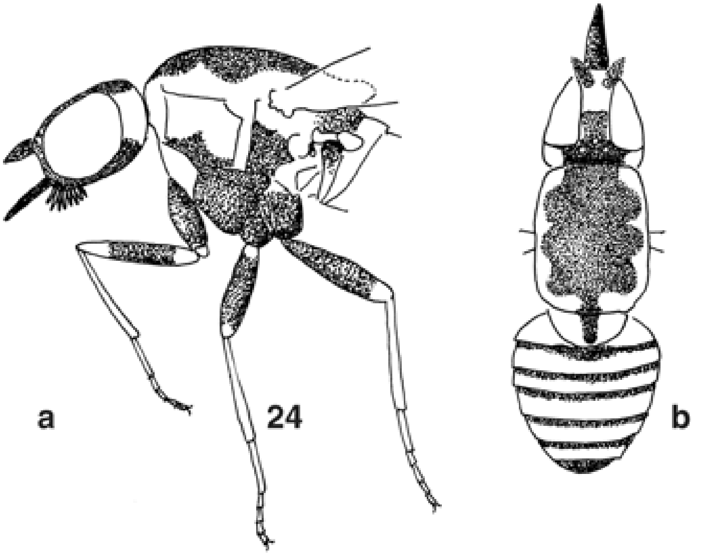
Hosts: Hesse (1967) recorded it from in and around the egg packets of the brown trek locust *Locustana pardalina* (Walker) in South Africa.

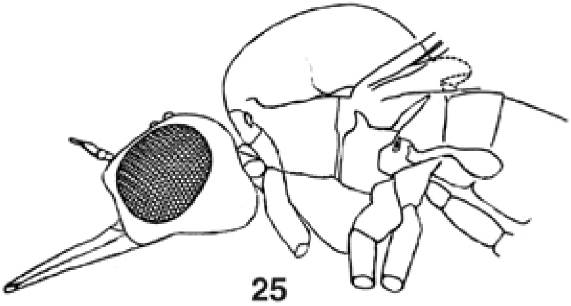
Distribution: Monotypic. South Africa: *Psiloderoides mansfieldi* Hesse.





Figs 22–23. Mythicomyiidae habitus drawings. 22. *Empidideicus zuluensis* (Hesse). 23. *Pseudoglabellula meridionalis* Hesse.





Figs 24–25. Mythicomyiidae, habitus drawings. 24. *Leylaiya whiteheadi* Greathead and Evenhuis sp. n. *a*. head and thorax, lateral view, wings removed. *b*. habitus, dorsal view, wings removed. 25. *Cyrtosia obscuripes* Loew, head and thorax, lateral view, wings removed.

Onchopelma Hesse

Onchopelma Hesse, 1938: 973. Type species: *Onchopelma pulchella* Hesse, 1938, by original designation

Comments: The genus is apparently indigenous to Namibia and South Africa. Three species are described in the genus. At least two additional new species are known and will be described elsewhere.

Key: Hesse (1967).

Distribution: Namibia, South Africa: 3 species; *Onchopelma karooanum* Hesse, *O. pulchellum* Hesse, *O. trilineatum* Hesse.

Platypyginae Verrall

Type genus: *Platypygus* Loew, 1844.

Verrall (1909) proposed this subfamily as a group that would contain those genera of Bombyliinae that have a 'simple cubital vein' [= unbranched R_{4+5}]. This essentially comprises all of the genera of Mythicomyiidae; but Verrall (1909) only listed *Platypygus* among the possible genera. Hull (1973) divided the mythicomyiids into Platypyginae and Mythicomyiinae, based on presence (Platypyginae) or absence (Mythicomyiinae) of vein R_{2+3}. Hull included the genera *Platypygus*, *Cyrtisiopsis*, *Cyrtosia*, *Cephalodromia* (as *Ceratolaemus*), *Onchopelma*, *Psiloderoides*, and *Cyrtomorpha* in his concept of Platypyginae. We here limit the subfamily to those genera with a long vein R_{2+3} (similar in length to R_{4+5}) and that ends in the costa well beyond the level of the end of vein M_2.

Key to genera of Platypyginae

1 Oral cavity with a prominent ventral sulcus, and produced posteriorly resulting in well developed postgena of either two lateral points or one single medial point (Fig. 16*b*) 2

– Oral cavity without a prominent ventral sulcus; postgena normal, or if produced posteriorly, a bulbous or blunt process (Fig. 25), not pointed 4

2 Discal cell closed distally by crossvein (Fig. 37); postgena developed into two lateral processes or posterior end of sulcus squared (Fig. 16*b*) 3

– Discal cell open distally, not closed by crossvein (Fig. 35); postgena developed into single point .... **Cephalodromia** Becker

3 Vein R1 short, ending in costa before level of r-m crossvein (Fig. 37); vein Sc complete, ending in costa; first antennal flagellomere with basoventral and apicoventral bulges (Fig. 12); crossvein r-m at middle of discal cell (Fig. 37); spermathecae with long sclerotised apical duct leading to spherical reservoir (Fig. 43) .... **Ahessea** Greathead and Evenhuis, gen. n.

– Vein Sc incomplete, no ending in costa; first antennal flagellomere shaped as in Fig. 6, without such bulges basally or apically; crossvein r-m at extreme base of discal cell (Fig. 38); spermathecae with thin, membranous apical ducts leading to kidney-shaped reservoir (Fig. 44) .... **Cyrtisiopsis** Séguy

4 Discal cell closed distally by crossvein .... **Platypygus** Loew

– Discal cell open distally, not closed by crossvein .... **Cyrtosia** Perris

Ahessea Greathead and Evenhuis **gen. n.**

Type species: *Cyrtisiopsis crassirostris* Hesse, 1938, by present designation.

Etymology: Named in honour of Albert J. Hesse, who has done much to lay the foundations for bombyliid and mythicomyiid work in southern Africa.

Diagnosis: Most similar to *Cyrtisiopsis* Séguy, but can be distinguished by the complete Sc; the position of crossvein r-m at the middle of discal cell, and the first antennal flagellomere with distinctive apical and basal bulges. Hesse's *crassirostris* characteristically has a very well developed occiput and very long mouthparts; however, an undescribed species of this genus from Namibia has much shorter mouthparts and the occiput is not as greatly expanded posteriorly. The detailed description of the species *crassirostris* by Hesse (1938) can serve to provide additional information on characterisation of the genus.

Distribution: Monotypic. South Africa: *Ahessea crassirostris* (Hesse). A further undescribed species from Namibia has been seen by NLE.

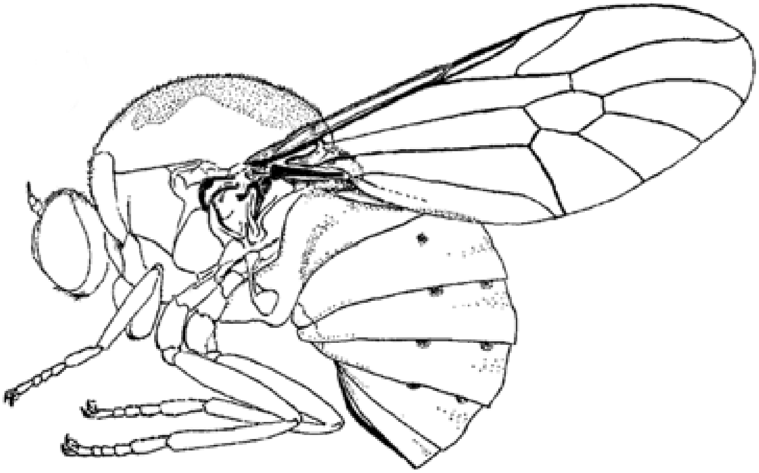


Fig. 26. *Psiloderoides mansfieldi*, female habitus, lateral (redrawn from Hesse 1967).

Cephalodromia Becker

Cephalodromia Becker, 1914: 121. Type species: *Cephalodromia curvata* Becker, 1914, by monotypy
Ceratolaemus Hesse, 1938: 969 (as subgenus of *Platypygus* Loew). Type species: *Platypygus xanthogrammus* Hesse, 1938, by original designation.

Comments: This genus is known from the southern and eastern Palaearctic, Afrotropical, and Oriental Regions. Many species of this genus were originally described in *Cyrtosia*.. Examination of types and topotypic specimens of many species in this study has resulted in the transfer of a number of species to *Cephalodromia* based on the shape of the postgena and genitalia. African species newly transferred to *Cephalodromia* here include the following: *Cephalodromia albocincta* (Séguy) comb. n.; *C. bicolor* (Santos Abreu) comb. n.; *C. dumonti* (Séguy) comb. n.; *C. flava* (Séguy) comb. n.; *C. humeralis* (Santos Abreu) comb. n.; *C. nitens* (Loew) comb. n.

Distribution: Northern Africa, Canary Islands: 5 species; *Cephalodromia albocincta* (Séguy), *C. bicolor* (Santos Abreu), *C. flava* (Séguy), *C. humeralis* (Santos Abreu), *C. nitens* (Loew). Southern Africa: 10 species.

Cyrtisiopsis Séguy

Cyrtisiopsis Séguy, 1930*b*: 80. Type species: *Cyrtisiopsis singularis* Séguy, 1930*b*, by original designation.

Comments: Transfer of *Cyrtisiopsis crassirostris* Hesse to the new genus *Ahessea* results in the restriction of this genus to northern Africa and the eastern Mediterranean with a single known species from North America: *Cyrtisiopsis americanus* (Melander), comb. n. [formerly in *Platypygus*].

Distribution: North Africa: 3 species; *Cyrtisiopsis algiricus* (Séguy) comb. n., *C. singularis* Séguy, *C. melleus* (Loew).

Cyrtosia Loew

Cyrtosia Perris, 1839: 54. Type species: *Cyrtosia marginata* Perris, 1839, by monotypy.

Comments: This genus is known from the Palaearctic and Afrotropical Regions.

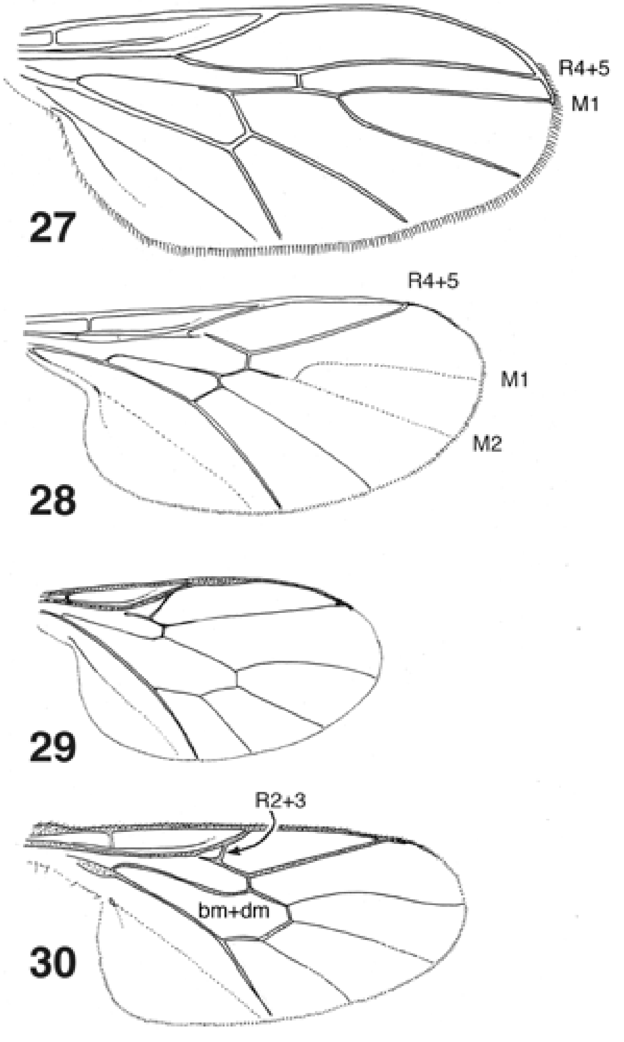
Currently, 34 species are known in this genus. Specimens described as *Cyrtosia* from Australia have been transferred to *Acridophagus* (see Evenhuis 1989), which is a member of the subfamily Psiloderoidinae.

Keys: Egypt: Efflatoun (1945); Mediterranean: Séguy (1949); Southern Africa: Hesse (1967).

Distribution: Northern Africa, Canary Islands: 23 species. Southern Africa: 2 species; *Cyrtosia namaquensis* Hesse, *C. stuckenbergi* Hesse.

Platypygus Loew

Platypygus Loew, 1844: 127. Type species: *Platypygus chrysanthemi* Loew, 1844, by monotypy.
Popsia Costa, 1863: 52. Type species: *Popsia ridibundus* Costa, 1863, by monotypy.



Figs 27–30. Mythicomyiidae wings. 27. *Leylaiya mellivora* (Hesse). 28. *Mnemomyia rostrata* Bowden. 29. *Glella ashleyi* Greathead and Evenhuis sp. n. 30. *Glabellula natalensis* Hesse.

Comments: *Platypygus* is primarily an Asian genus with most species occurring in western and central Asia (the single North American species has been transferred to *Cyrtisiopsis* – see above). The ranges of some of these species extend into Egypt, which allows us to include them here. Only one species is known from southern Africa.

Key: Engel's (1933) key to palaearctic species can be used to identify the species found in Egypt.

Distribution: Egypt: 6 species. South Africa: 1 species; *Platypygus natalensis* Hesse.

Unplaced to subfamily

Hesychastes Evenhuis

Hesychastes Evenhuis, 2001: in press. Type species: *Hesychastes solitus* Evenhuis, 2001, by original designation.

Comments: This genus, possessing an extremely small species (most specimens less than 1 mm in length), is currently unplaced to subfamily. It appears close to both Mythicomyiinae and Psiloderoidinae. Further analysis and comparison with all the genera of these subfamilies will have to be conducted to properly ascertain its proper subfamilial placement.

Distribution: Monotypic. Namibia: *Hesychastes solitus* Evenhuis.

BOMBYLIIDAE

The Bombyliidae *sensu stricto* range from very small, inconspicuous flies to very large and conspicuous flies (1–25 mm). Many of them, particularly Bombyliinae, are hairy and have a general resemblance to bees and wasps, hence the common name bee flies. Most are capable of rapid flight, and many Bombyliinae, particularly males, hover over a marker. Bombyliidae also bask on the ground, and females of those subfamilies with an abdominal sand-chamber can be commonly observed filling it with sand grains by dipping the tip of the abdomen in fine sand. The adults, except those with vestigial mouthparts, feed on nectar and pollen.

Oligodraninae Evenhuis

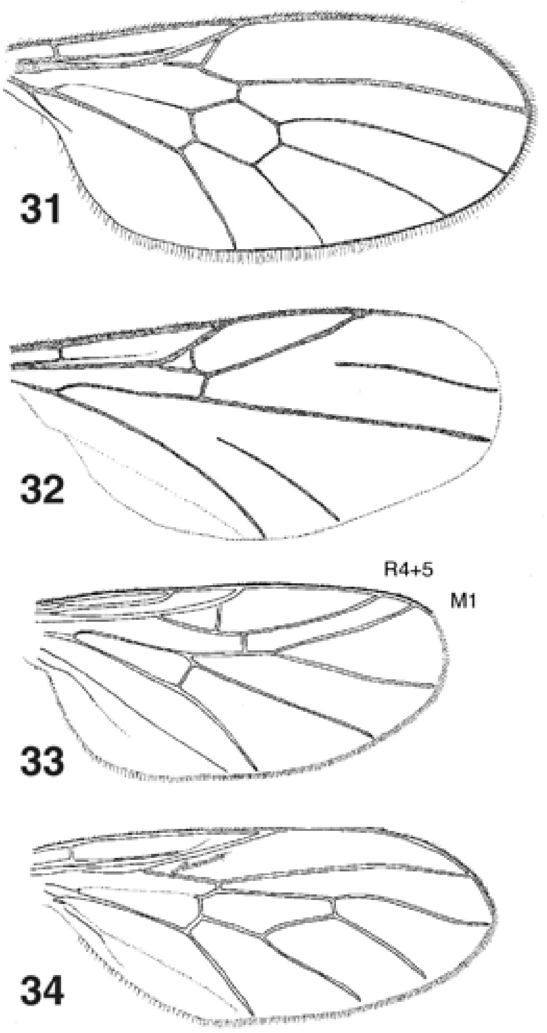
Type genus: *Oligodranes* Loew, 1844.

Oligodranes Loew

Oligodranes Loew, 1844: 160. Type species: *Oligodranes obscuripennis* Loew, 1844, by subsequent designation (Becker 1913: 484).

Comments: Evenhuis (1990*a*) showed that most species formerly placed in the genus *Oligodranes* are actually members of other genera, chiefly *Apolysis* (which he redefined to include species with an enclosed discal cell), and that *Oligodranes* itself has characters that exclude it from both the Phthiriinae and the Usiinae. Accordingly, he proposed the new subfamily, Oligodraninae, to contain it. *Oligodranes* has a distinct face below the antennae, two-segmented palpi, a distinct terminal second flagellomere, and acanthophorites and a sand-chamber. The phylogenetic analysis of Yeates (1994) placed the Oligodraninae between the Mythicomyiidae and the remaining Bombyliidae.

As presently defined, there are only two known species of *Oligodranes*, both known from the eastern Mediterranean Basin, thus the genus may eventually be found in Egypt.



Figs 31–34. Mythicomyiidae wings. 31. *Reissa roni* Evenhuis and Báez sp. n. 32. *Doliopteryx welwitschia* Evenhuis. 33. *Pseudoglabellula meridionalis* Hesse. 34. *Empidideicus zuluensis* (Hesse).

Distribution: Eastern Mediterranean Basin to Central Asia. Doubtfully present in Africa. Species described from Africa hitherto are species of *Apolysis* sensu Evenhuis (1990*a*).

Usiinae Becker

Type genus: *Usia* Latreille, 1802.

Evenhuis (1990*a*) revised the world genera of the Usiinae and Phthiriinae, which he recognised as closely related, but Yeates (1994) found that they formed a monophyletic group and united them as a single subfamily, Usiinae. However, the characters proposed by Evenhuis (1990*a*) for separating the two subfamilies (Evenhuis 1990*a*) have been re-examined and are considered to justify the recognition of two distinct subfamilies (Evenhuis & Greathead 1999).

The Usiinae are readily separated from the Phthiriinae by the first flagellomere having a subapical sulcus bearing a style and being without dorsal or ventral processes, and on the absence of vein M_2 (three posterior cells).

Key to tribes and genera of Usiinae

1 Flagellum with an articulated spine-like second flagellomere in addition to a stylus (Fig. 62); discal cell open or closed by crossvein m-m; narrow-bodied flies usually under 3 mm .... [**Apolysini**] **Apolysis** Loew

– Flagellum without a second flagellomere (Fig. 64); discal cell always closed by crossvein m-m; compact bee-like flies over 3mm .... **Usiini**...2

2 Oral margin narrow in frontal view, genae almost non-existent or extremely narrow, usually only represented by a ridge between oral cavity and inner eye margin (Fig. 50*b*); males dichoptic .... **Usia** Latreille 3

– Oral margin much broader, genae present between inner eye margin and oral cavity (Fig. 49*b*); males usually holoptic .... **Parageron** Paramonov

3 Integument of thorax and abdomen scrobiculate, usually shining to subshining; flagellum clavate at apex; male genitalia usually inconspicuous .... **Usia** subgenus **Usia** Latreille

– Integument of thorax and abdomen not scrobiculate, usually shining to subshining (pollinose in some males); flagellum not clavate at apex; male genitalia very large and conspicuous .... **Usia** subgenus **Micrusia** Evenhuis

Apolysini Evenhuis

Type genus: *Apolysis* Loew, 1860.

Apolysis Loew

Apolysis Loew, 1860*a*: 86 [1860*b*: 269; 1860*c*: 197]. Type species: *Apolysis humilis* Loew, 1860, by monotypy.

Comments: Evenhuis (1990*a*) revised the generic concepts of *Apolysis* and showed that many species described as *Oligodranes* belong to it, including all those present in Africa. Thus, the discal cell may be enclosed by a terminal crossvein or open. All species are small to minute, usually under 5 mm in length and often less than 2 mm.

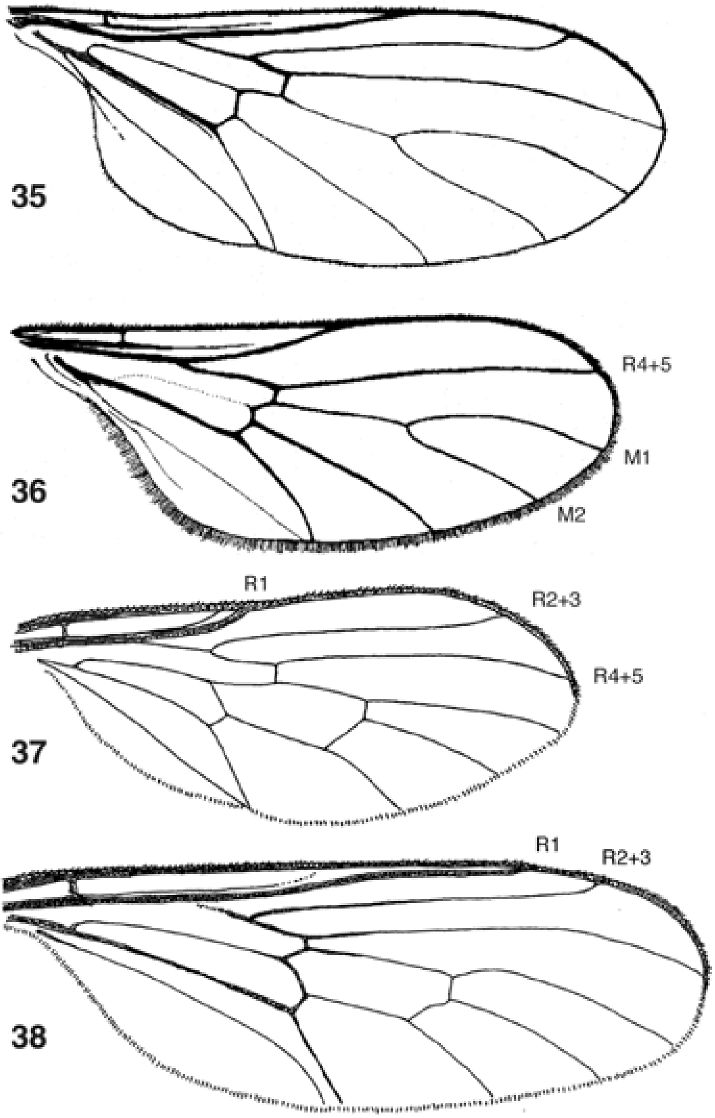
Keys: Palaearctic species (Engel 1932–7, Paramonov 1947); southern African species (Hesse 1975). All as both *Apolysis* and *Oligodranes*.

Hosts: A pupa of *A.* ?*capicola* Hesse has been reared from a nest of *Quartinia* sp. (Vespidae: Masarinae) in Namibia (Greathead 1999*b*).

Distribution: Holarctic, Neotropical, Oriental and Afrotropical Regions. North Africa: 2 species; *Apolysis eremophila* Loew (also Canary Islands), *A. ornata* (Engel). Africa South of the Sahara: 29 species.

Usiini Becker

The Usiini are confined to the southern Palaearctic. The species are weak fliers and are usually encountered resting on flowers, chiefly Asteraceae. They show a remarkable convergence with the southern African Mariobezziinae both in appearance and behaviour



Figs 35–38. Mythicomyiidae wings. 35. *Cyrtosia* sp. (from Hull 1973). 36. *Empidideicus turneri* Hesse (from Hull 1973). 37. *Ahessea crassirostris* (Hesse). 38. *Cyrtisiopsis singularis* Séguy.

(e.g. Johnson & Dafni 1998). Evenhuis (1990*a*) redefined the genera and transferred several species from *Usia* to *Parageron*.

Parageron Paramonov

Parageron Paramonov, 1929: 189. Type species: *Parageron orientalis* Paramonov, 1929 [= *Usia lutescens* Bezzi, 1925], by monotypy.

Comments: *Parageron* spp. are more widespread than *Usia* spp. and also occur in the Eastern Palaearctic. They are often larger and less uniform in appearance; frequently with greyish yellow to bright yellow bands on the abdomen.

Keys: Engel (1932–7), Paramonov (1947 1950), and for Egypt, Efflatoun (1945) provided keys to species of Usiini, but species allocations between *Usia* and *Parageron* have changed since these keys were written.

Distribution: Palaearctic Region and north-eastern Africa. North Africa, Canary Islands: at least 6 species. Africa South of the Sahara: Eritrea: 1 species; *Parageron erythraeus* (Greathead).

Usia Latreille

Voluccella Fabricius, 1794: 412. Type species: *Voluccella florea* Fabricius, 1794, automatic (by designation of type species for *Usia* Latreille).

Usia Latreille, 1802: 430 (unjustified new replacement name for *Voluccella* Fabricius, 1794). Type species: *Voluccella florea* Fabricius, 1794, by subsequent designation (Fabricius, 1810: 443).

Zerinthia Rafinesque, 1815: 130 (unnecessary new replacement name for *Usia* Latreille, 1802). Type species: *Voluccella florea* Fabricius, 1794, automatic.

[In the interest of stability and usage, the name *Usia* is maintained here. An application to the I.C.Z.N. to conserve *Usia* over *Voluccella* is in preparation. See Evenhuis (1991: 77–78) for details on the nomenclatural history of *Usia* Latreille and *Voluccella* Fabricius.]

Comments: The genus *Usia* is less widespread than *Parageron,* with the majority of species confined to the Mediterranean Basin. They are shining black, often glinting with metallic colours.

Key: Engel (1932–7), Paramonov (1947 1950), and for Egypt, Efflatoun (1945) provided keys to species of Usiini, but species allocations between *Usia* and *Parageron* have changed since these keys were written.

Hosts: *Usia* (*Usia*) *atrata* (Fabricius) has been reared from the pupa of a tenebrionid in France (du Merle 1975).

Subgenus *Micrusia* Evenhuis

Micrusia Evenhuis, 1990*a*: 38. Type species: *Usia forcipata* Brullé, 1833, by original designation.

Distribution: Mediterranean Basin. North Africa: 5 species; *Usia aurata* (Fabricius), *U. forcipata* Brullé, *U. novakii* Strobl, *U. pusilla* Meigen, *U. versicolor* (Fabricius).

Subgenus *Usia* Latreille

Distribution: Mediterranean Basin to central Asia and India. Canary Islands: 1 species; *U. arida* Báez. North Africa: 22 species, reaching as far south as the Sudan.

Phthiriinae Becker

Type genus: *Phthiria* Meigen, 1803.

The Phthiriinae are readily separated from the Usiinae by the first flagellomere, which in Phthiriinae has a subapical sulcus bearing a style and dorsal and/or ventral processes; also vein M_2 is present (four posterior cells). Only the nominate genus, *Phthiria*, is present in Africa and Eurasia, but in the Americas there are five endemic genera, and another three are endemic to Australia (Evenhuis 1990*a*).

Phthiria Meigen

Phthiria Meigen, 1803: 268. Type species: *Bombylius pulicarius* Mikan, 1796, by monotypy.

Ptimia Rafinesque, 1815: 221 (unjustified emendation of *Phthiria* Meigen, 1803). Type species: *Bombylius pulicarius* Mikan, 1796, automatic.

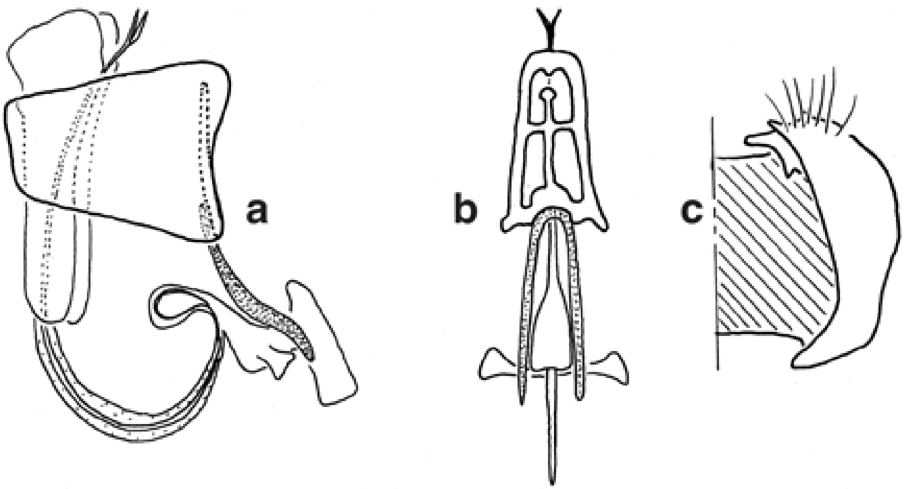


Fig. 39. *Reissa roni* Evenhuis and Báez sp. n., male genitalia. *a*. lateral view. *b*. gonocoxa and phallic complex, ventral view. *c*. epandrium, ventral view.

Comments: The majority of known species have been recorded in North Africa or southern Africa. However, *Phthiria fumata* (Greathead) was described from Kenya (as *Oligodranes*) and females of *P.* ?*crocogramma* Hesse have been collected in Kenya, as have single specimens of two further species. Thus, it is likely that further collecting in tropical Africa, especially Malaise and yellow-pan trapping, will indicate a more continuous distribution of species on the African continent.

Keys: Palaearctic, Engel (1932–7); Egypt, Efflatoun (1945); southern Africa, Hesse (1975).

Hosts: Reared from Gelechiidae and Tortricidae (du Merle 1975). No African records.

Distribution: Old World and Chile. North Africa, Canary Islands: 13 species. Africa South of the Sahara: South and East Africa: 19 species.

Toxophorinae Schiner

Type genus: *Toxophora* Meigen, 1803.

Bowden (1980) united the Toxophorinae, Systropodinae and Gerontinae of authors as tribes within a single subfamily. The phylogenetic analysis of Yeates (1994) supports his conclusion. The antennae of all three tribes have a single flagellomere without a style, lack vein M_2 (three posterior cells) and cell cup is closed. The males also have complex genitalia, with heavily sclerotised processes on the gonocoxae and/or epandrium, and elaborate processes on the phallosome. The females have elongate tubular, coiled spermathecal bulbs.

Key to tribes and genera of Toxophorinae

1 Pronotum well developed and with strong bristles; mesothorax humped; proboscis as long as or shorter than head; body with a striking pattern of dense scales (Fig. 26) .... [**Toxophorini**] **Toxophora** Meigen

– Pronotum normal, without bristles; mesothorax humped or not; proboscis elongate, longer than head 2

2 Metasternum elongate, widely separating mid and hind coxae; abdomen long, slender, tending to be swollen apically in males; body almost bare and with short fine hairs only; mimics of Sphecidae, Vespidae and Ichneumonidae ...... [**Systropodini**] **Systropus** Wiedemann…4

– Metasternum normal; mid and hind coxae not separated; abdomen tapered but not conspicuously elongated, apex not swollen in males; body with fine hair and scattered scales, usually whitish or brownish .... [**Gerontini**] **Geron** Meigen…3

3 Base of cell r_4 (second submarginal) usually distal to apex of discal cell; genae narrow and distance between eyes across oral cavity little wider than across face below antennae; males holoptic; spicules on tibiae present from near their bases; thorax markedly humped and deep .... **Geron** subgenus **Geron** Meigen

– Base of cell r_4 (second submarginal) more or less level with apex of discal cell; genae broad and distance between eyes across oral cavity much wider than across face below antennae; males dichoptic, eyes separated by at least width of median ocellus; spicules on tibiae confined to apical halves; thorax not markedly humped and deep .... **Geron** subgenus **Pseudoammictus** Bigot

4 Abdominal petiole composed of segments 2 and 3; face with a dense tuft of hair below antennae; with black and yellow cuticle resembling *Sceliphron* spp. (Vespidae) **Systropus** subgenus **Dimelopelma** Enderlein

– Abdominal petiole with 3 or 4 segments; face with at most sparse hair 5

5 Wing with well developed alula; subcosta bare below; pleura with dense tufts of hair; abdomen attenuate, petiole with 4 segments .... **Systropus** subgenus **Teinopelmus** Bowden

– Wing with alula greatly reduced; subcosta with hairs below; propleuron at most with sparse pubescence; abdomen not markedly attenuate, petiole with 3 or 4 segments 6

6 Wing, if infuscated, unicolorous; body entirely black or with red or yellow areas; ligament between wing base and scutellum bare; metanotum poorly developed ..... **Systropus** subgenus **Systropus** Wiedemann

– Wing yellow at base and in costal area, apex darker and veins often with dark borders; body reddish; ligament between wing base and scutellum with hairs; metanotum well developed; large species resembling *Belonogaster* spp. (Vespidae) .... **Systropus** subgenus **Diaerops** Enderlein

Gerontini Hesse

Type genus: *Geron* Meigen, 1820.

This tribe comprises a single genus with three small subgenera each confined to a single zoogeographical region (*Empidigeron* Painter in the Nearctic Region, *Plichtamyia* Evenhuis in the Australasian Region, and *Pseudoammictus* Bigot in southern Africa) and the cosmopolitan subgenus, *Geron sensu stricto*. *Geron* is one of the few genera of Bombyliidae present on oceanic islands.

Geron Meigen

Geron Meigen, 1820: 223. Type species: *Geron gibbosus* Meigen, 1820 [= *Bombylius gibbosus* Olivier, 1789], by subsequent designation (Duponchel *in* d'Orbigny, 1845: 206).

Amictogeron Hesse, 1938: 918. Type species: *Amictogeron meromelanus* Hesse, 1938, by original designation.

Comments: Hesse (1938) proposed the genus *Amictogeron* for African species with dark vestiture and a tendency for the wings to be tinged smoky brown, various subtle differences in the external morphology, and male genitalia. However, Bowden (1974) showed that there is no clear distinction between species of *Amictogeron* and *Geron sensu stricto*. He also synonymised *Pseudoammictus* with *Geron,* but Evenhuis (1979*a*) retained it as a subgenus. There are few external characters for distinguishing species, but the males have complex genitalia, and the females a subgenital plate providing both sexes with good characters for the separation of species. Examination of the genitalia is essential for accurate identification, and older distribution records based on external characters are not reliable (Greathead 1999*c*).

Subgenus *Geron* Meigen

Keys: Palaearctic, Engel (1932–7); Egypt, Efflatoun (1945); Mediterranean Basin, Greathead (2001*b* in press); Afrotropical, Bezzi (1924); southern African species, Hesse (1938) as *Geron* spp. and *Amictogeron* spp.

Hosts: Endoparasitoids of pupae of Lepidoptera, mostly Pyralidae and Psychidae (du Merle 1975; Yeates & Greathead 1997).

Distribution: Cosmopolitan. North Africa, Canary Islands: 7 species. Africa South of the Sahara: 61 species. Madagascar: 3 species; *G. candidulus* Bowden, *G. dilutus* Bowden, *G. varicapillis* Bowden. Cape Verde Islands: 2 species; *G. phallophorus* Bezzi, *G. priapeus* Bezzi. Aldabra; 1 species; *G. dilutus*. Seychelles; 1 species; *G. seychellarum* Greathead. Socotra: 1 species; identified as *G. gibbosus* by Becker (1910), but this is undoubtedly a misidentification.

Subgenus *Pseudoammictus* Bigot

Pseudoammictus Bigot, 1892: 342 (as genus). Type species: *Amictus heteropterus* Wiedemann, 1821 (as '*Ammictus*'), by original designation.

Pseudempis Bezzi, 1921*a*: 94. Type species: *Amictus heteropterus* Wiedemann, 1821 [misidentification, = *Pseudoamictus bezzii* Paramonov, 1930], by original designation.

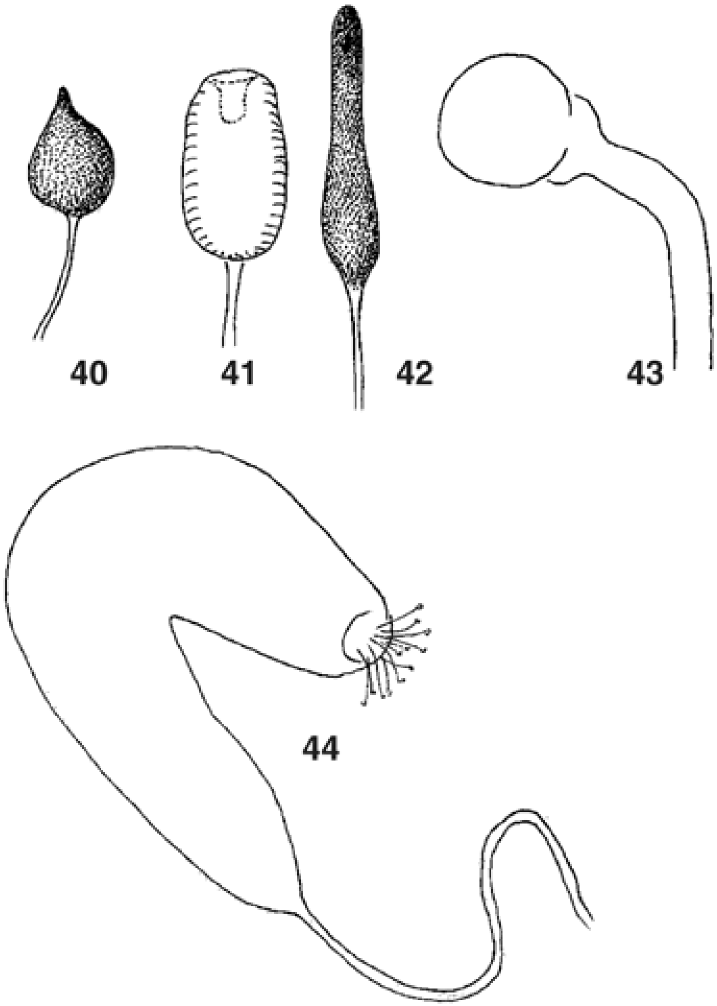
Key: Hesse (1938) keyed the species as a separate genus, *Pseudoammictus*.

Distribution: Southern Africa: 3 species; *Geron* (*P.*) *bezzii* Paramonov, *G.* (*P.*) *heteropterus* Wiedemann, *G.* (*P.*) *luctuosus* Bezzi.

Systropodini Brauer

Type genus: *Systropus* Wiedemann, 1820.

This tribe is comprised of only three genera, the New World *Dolichomyia*, the Australasian *Zaclava,* and *Systropus,* which occurs in all zoogeographical regions. However, it is absent from the Western Palaearctic, although it is particularly diverse in the Afrotropical Region and Eastern Asia, especially China. Bowden (1967) separated the afrotropical species into four subgenera, but species from other regions have not been recognised within subgenera.



Figs 40–44. Mythicomyiidae, female spermathecae. 40. *Reissa roni* Evenhuis and Báez sp. n. 41. *Empidideicus freyi* Greathead. 42. *Glella ashleyi* Greathead and Evenhuis sp. n. 43. *Ahessea crassirostris* (Hesse). 44. *Cyrtisiopsis melleus* (Loew).

Systropus Wiedemann

Systropus Wiedemann, 1820: 18. Type species: *Systropus macilentus* Wiedemann, 1820, by original designation (on plate).

Céphène Latreille, 1825: 496 (unjustified new replacement name for *Systropus* Wiedemann, 1820) [Unavailable; vernacular name without nomenclatural status.]

Cephenus Berthold, 1827: 506 (unnecessary new replacement name for *Systropus* Wiedemann, 1820 (as '*Systrophus*')). Type species: *Systropus macilentus* Wiedemann, 1820, automatic.

Cephenes Latreille, 1829: 505. Type species: *Systropus macilentus* Wiedemann, 1820, by subsequent designation (Evenhuis, 1991: 25). [Unavailable; name proposed in synonymy with *Systropus* Wiedemann and not made available before 1961.]

Systropus Jensen, 1832: 235. Type species: *Systropus macilentus* Jensen, 1832 [= *Systropus macilentus* Wiedemann], by monotypy. [Preoccupied by Wiedemann, 1820.]

Xystrophus Agassiz, 1846: 393 (unnecessary emendation of *Systropus* Wiedemann, 1820). Type species: *Systropus macilentus* Wiedemann, 1820, automatic.

Cephenius Enderlein, 1926: 70. Type species: *Systropus studyi* Enderlein, 1926, by original designation.

Coptopelma Enderlein, 1926: 70. Type species: *Coptopelma schineri* Enderlein, 1926 [misidentification, = *Systropus sanguineus* Bezzi, 1921], by original designation.

Symballa Enderlein, 1926: 70, 92. Type species: *Systropus leptogaster* Loew, 1860 [misidentification, = *Systropus holaspis* Speiser, 1914], by original designation.

Comments: All *Systropus* spp. have an elongate body and petiolate abdomen, and appear to mimic Hymenoptera. Unlike most genera of Bombyliidae, they are most abundant in dense vegetation, including forest. They are relatively slow in flight, and tend to hang from the front legs when at rest as do species of Tipulidae and Bittacidae.

Keys: Afrotropical, Bowden (1967); southern Africa, Hesse (1963).

Hosts: Endoparasitoids of Limacodidae (du Merle 1975; Yeates & Greathead 1997).

Subgenus *Diaerops* Enderlein

Diaerops Enderlein, 1926: 70 (as genus). Type species: *Systropus marshalli* Bezzi, 1924, by original designation.

Coptodicrus Enderlein, 1926: 70, 91 (as genus). Type species: *Coptodicrus vespiformis* Enderlein, 1926, by original designation.

Distribution: Afrotropical: 1 species, *Systropus* (*D.*) *marshalli*.

Subgenus *Dimelopelma* Enderlein

Dimelopelma Enderlein, 1926: 70, 90 (as genus). Type species: *Dimelopelma tessmanni* Enderlein, 1926, by original designation.

Distribution: Afrotropical: 6 species.

Subgenus *Systropus* Wiedemann

Distribution: Cosmopolitan, chiefly in forested regions butabsent from the West Palaearctic. Africa South of the Sahara: 29 species. Madagascar: 2 species; *Systropus limacodidarum* Enderlein, *S. quadrinotatus* Séguy.

Subgenus *Teinopelmus* Bowden

Teinopelmus Bowden, 1967: 137. Type species: *Systropus rugosus* Bezzi, 1924, by original designation.

Distribution: Afrotropical: 6 species.

Toxophorini Schiner

This tribe includes a single genus, *Toxophora*, which is extremely uniform in appearance, comprising species with elongate antennae, strong bristles and densely covered in scales which are usually black, sometimes iridescent, and a contrasting pale yellow or white colour.

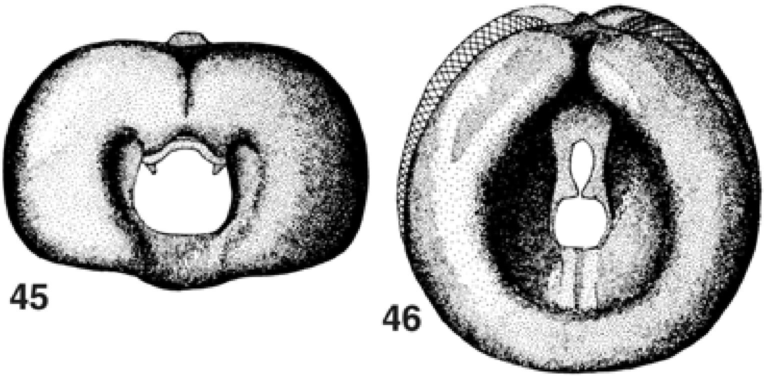
Toxophora Meigen

Toxophora Meigen, 1803: 270. Type species: *Toxophora maculata* Meigen, 1804 [preoccupied, = *Asilus fasciculatus* Villers, 1789], by subsequent monotypy (Meigen, 1804: 273).

Eniconevra Macquart, 1840: 110 [1841: 388]. Type species: *Eniconevra fuscipennis* Macquart, 1840, by monotypy.

Heniconevra Agassiz, 1846: 138, 178 (unjustified emendation of *Eniconevra* Macquart), 1840. Type species: *Eniconevra fuscipennis* Macquart, 1840, automatic.

Heniconeura Bezzi *in* Becker *et al.*, 1903: 189 (unjustified emendation of *Eniconevra* Macquart, 1840). Type species: *Eniconevra fuscipennis* Macquart, 1840, automatic.



Figs 45–46. Bombyliidae heads, posterior view (redrawn from Theodor 1983). 45. *Bombylius* sp. 46. *Pachyanthrax telamon* (Loew).

Comments: *Toxophora* spp. are quite common but seldom abundant, so most collections contain only one or very few specimens taken on the same occasion.

Keys: Palaearctic, Engel (1932–7); Egypt, Efflatoun (1945); Afrotropical, Bezzi (1924); Ghana, Bowden (1964); southern Africa, Hesse (1963).

Hosts: Parasitic in nests of solitary wasps (principally Eumeninae) and bees usually situated above ground (du Merle 1975; Yeates & Greathead 1997).

Distribution: Cosmopolitan. North Africa: 6 species. Africa South of the Sahara: 18 species. Madagascar: 1 species; *T. seyregi* Séguy.

Crocidiinae Hull

Type genus: *Crocidium* Loew, 1860.

Yeates (1994) separated the Crocidiini from the Bombyliinae and raised the tribe to subfamily status. They are rather delicate, elongate flies characterised by the presence of mid-tibial spurs and coxal pegs.

Hitherto, Crocidiinae have been infrequently collected, but large numbers of specimens are being obtained in Malaise traps and yellow pan traps. For example, recent collecting in Namibia using these methods has produced large numbers of specimens and several new species (Greathead 2000*a*,*b*), several undescribed. Thus, it is likely that the number of described species will increase considerably and the distribution patterns of genera and species will become better understood.

Key to genera of Crocidiinae

1 Genae broad; wings with or without spots, hyaline or tinted; alula broad; axillary lobe broad, triangularly produced and rounded posteriorly; knobs of halteres less than twice as long as wide; asilid-like .... **Crocidium** Loew

– Genae narrow, almost absent; wings tinted or infuscated; alula narrow; axillary lobe not enlarged; knobs of halteres about twice as long as wide; empid-like .... **Apatomyza** Wiedemann

Apatomyza Wiedemann

Apatomyza Wiedemann, 1820: 11. Type species: *Apatomyza punctipennis* Wiedemann, 1820, by original designation (on plate).

Apatomyza Jensen, 1832: 326. Type species: *Apatomyza punctipennis* Jensen, 1832 [preoccupied, = *Apatomyza punctipennis* Wiedemann, 1820], by monotypy. [Preoccupied by Wiedemann, 1820.]

Adelogenys Hesse, 1938: 811. Type species: *Adelogenys culicoides* Hesse, 1938, by original designation.

Comments: Lamas *et al.* (2001) have recently shown that *Adelogenys* Hesse is a junior synonym.

Key: Lamas *et al.* (2001).

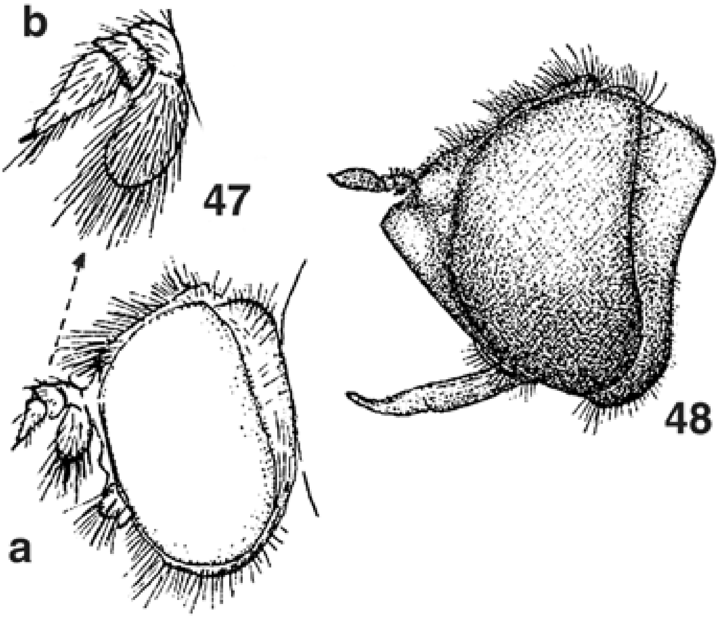
Distribution: Southern Africa: 4 species; *A. braunsii* (Hesse), *A. culicoides* (Hesse) (Namibia), *A. namaquaensis* (Hesse), *A. punctipennis* Wiedemann. A further 3 species are being described in Lamas *et al.* (2001).

Crocidium Loew

Crocidium Loew, 1860*a*: 85 [1860*b*: 267; 1860*c*: 195]. Type species: *Crocidium poecilopterum* Loew, 1860, by monotypy.

Keys: Egypt, Efflatoun (1945); southern Africa, Hesse (1963).

Distribution: Palaearctic and Afrotropical Regions. North Africa: Egypt: 2 species; *Crocidium aegyptiacum* Bezzi, *E. nudum* Efflatoun. Africa South of the Sahara: Southern Africa: 22 species, including 2 recently described species from Namibia (Greathead 2000*a*).



Figs 47–48. Bombyliidae heads (from Hesse 1956). 47. *Xenoprosopa paradoxa* Hesse. *a*. head, lateral view. *b*. detail of antenna showing ventral protuberance. 48. *Tomomyza pictipennis* Hesse, lateral view.

Heterotropinae Becker

Type genus: *Heterotropus* Loew, 1873.

The genus *Alloxytropus* Bezzi (1925), synonymised with *Prorates* Melander by some authors, was described from Egypt in the Heterotropinae, but Yeates & Irwin (1992) showed that it is a member of the Scenopinidae and transferred it to that family, along with certain American genera as the subfamily Proratinae. Thus, the Heterotropinae, as now constituted, is monotypic. However, *Heterotropus* itself is enigmatic and has many plesiomorphic characters, including those of the free-living predatory larvae (Yeates & Irwin 1992), which suggest that it should be removed from the Bombyliidae, but the phylogenetic study of Yeates (1994) placed it as a clade between the Toxophorinae and the Bombyliinae.

Species of *Heterotropus* show a considerable degree of variation: notably, males holoptic or dichoptic, aedeagus with two or three prongs. Further, a recently-discovered species from Namibia, *H. apertus* Greathead (2000*a*), has an open cell cup, unlike all other described species, and the gonostyli lack the median process otherwise characteristic of the genitalia of those species that have been dissected. A world revision of the subfamily is needed, along with a phylogenetic analysis, to determine the relationships between this and other species.

Heterotropus Loew

Heterotropus Loew, 1873: 182. Type species: *Heterotropus albidipennis* Loew, 1873, by monotypy.
Malthacotricha Becker, 1907*b*: 312. Type species: *Malthacotricha glauca* Becker, 1907, by monotypy.

Comments: *Heterotropus* spp. are small, bare flies with a pattern of black and yellow or ivory areas on the cuticle. The distribution of these dark and light areas has been used to differentiate species, but it is highly variable so that species and records based on identifications from colour pattern only are in need of re-evaluation. The male genitalia exhibit specific differences and should be examined to confirm identifications.

Keys: Palaearctic, Paramonov (1929); Egypt, Efflatoun (1945); North Africa, Séguy (1938*b*); South Africa, Yeates & Irwin (1992).

Hosts: The larvae are elongate, therevid-like, and predacious, living in soil (Yeates & Irwin 1992).

Distribution: Palaearctic, Afrotropical and Oriental Regions. North Africa, Sudan: 17 species. Africa South of the Sahara: 12 species, including *Heterotropus apertus* Greathead (2000*a*).

Bombyliinae Latreille

Type genus: *Bombylius* Linnaeus, 1758.

The Bombyliinae is the largest of the subfamilies of Bombyliidae in numbers of genera, and its generic composition has been altered greatly since it was defined by Becker (1913), owing to the inclusion or exclusion of genus groups by successive authors. The *Corsomyza* group of genera, included by Hesse (1938), was shown by Theodor (1983) to have a deeply concave and divided occiput and is now placed in the Mariobezziinae (Yeates 1994). Bowden (1980) divided the African genera into Bombyliini, Dischistini, Conophorini and Crocidiini. The Crocidiini, added by Hesse

(1938), have since been removed to a separate subfamily (Yeates 1994). Phylogenetic analysis of the Bombyliini and Dischistini has failed to find a single autapomorphy for the Dischistini (Yeates 1994; Greathead 1995), or indeed a single key character that could be used to define it – the two principal characters, open cell r_5 and bare laterotergite, are both plesiomorphies and variable between genera and species. However, although recognition of the Dischistini has the merit of breaking down an unwieldy list of genera – and of separating genera of probable origin in Gondwana from those originating in Laurasia – the division of the genera into Bombyliini and Dischistini has been abandoned. If recognised, the split would take place at the first couplet of the key to genera of Bombyliini.

Key to the tribes of Bombyliinae

1 Wing with discal cell broad towards apex, vein m-m meets dm-cu at an obtuse angle; radial sector broad with costa tending to bulge forwards near apex of wing (Fig. 84); mid-tibial spurs present in some genera .... **Conophorini**

– Wing with discal cell broadest near middle, vein m-m meets dm-cu at not much more than a right angle; radial sector not enlarged with costa more or less straight along fore margin of wing (Figs 81–82); mid tibial spurs always absent .... **Bombyliini**

Bombyliini

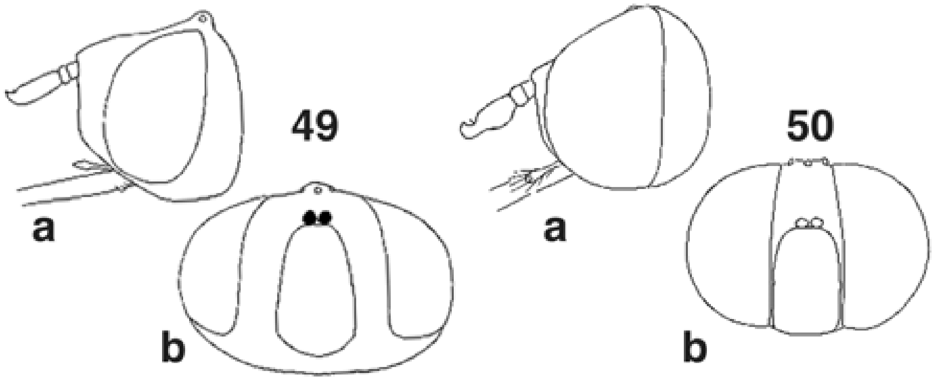
The genus *Bombylius sensu lato* has been revised (Greathead 1995) and shown to comprise a series of genera, and that *Systoechus* is a clade within the clade composed of these genera.

Key to the genera of Bombyliini

1 Head usually distinctly narrower than thorax; laterotergites always with hair and cell r_5 (first posterior) usually closed at a distance from the wing margin (Figs 81–83); wings usually large, broad at base with anal lobe, alula and squama well developed; hind femora always with well developed bristles on underside; body always broad, bristles usually well developed; male genitalia with narrow or leaf-like gonostyli, aedeagus sheathed by epiphallus which only rarely has clasper-like outgrowths, phallosome projecting from middle of gonocoxae, apodemes usually large (Fig. 101) 2

– Head usually as broad as thorax; laterotergites bare and/or cell r_5 broadly open at wing margin (cf. Figs 84–85); wings often small, narrowed at base with at least alula reduced; hind femora often without bristles; body usually more elongate even narrow conical or cylindrical, bristles usually weak, often hair-like, especially those posterior to the wings; often with long robust gonostyli ending in a curved point; phallosome usually with a large blunt epiphallus and originating near base of gonocoxae, apodemes usually small (Figs 102–103) 10

2 Head as wide as thorax; hind margin of eye indented; cell r_5 (first posterior) pointed and closed near the wing margin; with strong bristles on head and body, including hind margins of abdominal terga; with gold scaling on head and body with a pattern of short black and white hair and scales (Fig. 76); male genitalia (Fig. 104) with a



Figs 49–50. Bombyliidae heads (from Evenhuis 1990*a*). 49. *Usia bicolor* Macquart. *a*. lateral view. *b*. frontal view. 50. *Parageron ignoratus* (Becker). *a*. lateral view. *b*. frontal view.

crest of strong spines at apex of gonocoxae which also bear a tuft of long hairs on the dorsal surface, phallosome long and slender without an epiphallus .... **Eurycarenus** Bezzi

– Head usually narrower than thorax; hind margin of eye not indented; cell r_5 closed and stalked; hair long and dense; gonocoxae without a crest of strong spines or a tuft of long hairs on the dorsal surface, phallosome with or without a prominent epiphallus 3

3 Cell br (first basal) longer than cell bm (second basal) (Fig. 79), r-m sometimes equal to m-m; vestiture various, often with black hair and/or scale patches; wing pattern various, sometimes with a clear-cut dark infuscation and/or with isolated dark spots; phallosome usually without clasper-like outgrowths (Fig. 101) 4

– Cell br equal in length to bm; r-m usually much shorter than m-m, occasionally almost as long; vestiture fine and silky with a clipped appearance at least on occiput and thorax, hair white to straw-yellow or brown shading to paler on underside; wing infuscation, if present, diffuse and darker along fore border (Figs 80–81); male with phallosome compact often with clasper-like outgrowths (Fig. 105) .... **Systoechus** Loew

4 Abdomen appears truncated, rapidly tapered from tergum 4; terminalia appear similar in both sexes with cerci in female and processes on gonocoxae in males projecting; frons of female narrow, with eyes separated by less than width of ocellar triangle; gonocoxae with robust elongate terminal lobes, gonostyli thick, parallel-sided blunt or with a small point and with short hairs only (Fig. 106); female with a tubular ovipositor and vestigial sand-chamber, unlaid eggs large spherical and pigmented .... **Beckerellus** Greathead

– Abdomen ovate, tapered beyond tergum 4; terminalia normal; frons of female at least as broad as ocellar triangle; gonocoxae with terminal lobes no longer than wide, gonostyli slender, pointed and crowned with long hairs at base or broad with short upright hairs, female with a sand-chamber guarded by long silky hairs, unlaid eggs ellipsoidal, thin-walled, unpigmented 5

5 Eyes of males in contact for a distance at least equal to length of ocellar triangle; head always distinctly narrower than thorax; palpi unsegmented; legs usually very dark or black and at least bristles black; body cuticle mainly or entirely black; gonocoxae slender, gonostyli elongate slender with a tuft of long black hairs at base, phallosome usually without accessory structures 6

– Eyes of males in contact for less than length of ocellar triangle; head broad, sometimes as wide as thorax; palpi with two segments; legs pale but bases of femora and tarsi may be darkened; bristles almost always pale at least on males; body cuticle tending to have paler reddish or yellowish areas on calli; scutellum and sides of anterior abdominal terga; gonocoxae broad, gonostyli tending to be broader and shorter and without long black hairs, phallosome often with accessory structures (Fig.108) .... **Parisus** Walker

6 Crossvein r-m as long or longer than m-m; venation in radial sector unstable, often with appendices and sometimes with interradial vein complete (3 submarginal cells); vestiture shaggy but with long hair at sides of abdomen only, bristles fine not numerous, hair brown to blackish with contrasting short white scale-like hairs forming notopleural stripes on the thorax and spots or bands on the abdomen .... **Triplasius** Loew

– Crossvein r-m usually much shorter than m-m, occasionally almost as long; venation normal; vestiture more evenly distributed and differently coloured 7

7 Scape at least 3 x length of pedicel; small, relatively slender flies with relatively long, slender legs; alula long and narrow, squama reduced; vestiture usually predominantly black, hair long and tufted, usually with metallic or opalescent scales in spots on frons and often on thorax and abdomen .... **Bombylella** Greathead

– Scape at most 3 x length of pedicel; more robust and compact flies with shorter, less slender legs; alula broad, squama not reduced; vestiture often pale yellow to brown, if black without spots of metallic or opalescent scales 8

8 Scape about twice length of pedicel; upper facets of eyes of males not enlarged; face short and with short sparse hair only; wing base black, remainder hyaline or tinged yellowish; body hair short and with a clipped appearance, usually with abundant black elements contrasting with areas of white, orange or grey (Fig. 74) .... **Bombomyia** Greathead

– Scape more than twice length of pedicel; upper facets of eyes of males enlarged; face long, prominent and with long hair; wing pattern, if present, basicostal, often diffuse and sometimes with isolated spots, wing rarely completely infuscated; body hair usually long, sometimes tufted and rarely with a clipped appearance, usually predominantly white to yellow or brown with few black elements, if predominantly black then without a contrasting pattern of pale hair ...... **Bombylius** Linnaeus…9

9 No white scale-like hairs on scape and pedicel; bristles sparse or absent; epiphallus without a bulb-like dorsal process ..... **Bombylius** subgenus **Bombylius** Linnaeus

– White scale-like hairs present on scape and pedicel; bristles well developed; epiphallus usually with a bulb-like dorsal process .... **Bombylius** subgenus **Zephyrectes** Evenhuis

10 Laterotergites hairy and r_5 open or closed on wing margin 11

– Laterotergites bare but if obscured by long hair elsewhere on pleura and squama, then r_5 closed and with a long stalk 15

11 Cell r_5 narrowed or closed at wing margin; palpi with two segments; hair very short and sparse; gonocoxae very large and enclosing phallosome .... **Xerachistus** Greathead

– Cell r_5 broadly open, little if at all narrowed towards wing margin; palpi with one or two segments; hair not very short and sparse and/or with dense scales 12

12 Palpi one-segmented; males holoptic; vein m-m much shorter than r-m; with spots of metallic scales at sides of frons and often on the thorax and abdomen.......... 13

– Palpi two-segmented; males dichoptic; vein m-m about equal in length to r-m; without metallic scales 14

13 Pulvilli well developed; frons usually without patches of silver scales at either side of antennae in males; gonocoxae without a prominent crest; phallosome with a large epiphallus bearing two horn-like outgrowths (Fig. 102) .... **Bombylisoma** Rondani

– Pulvilli not developed; frons with patches of silver scales at either side of antennae in both sexes; gonocoxae with a broad lobe-like apical crest; phallosome without a prominent epiphallus .... **Eremyia** Greathead

14 Hair normal, long and distributed evenly over the body; sand-chamber present; gonostyli broadly leaf-shaped .... **Doliogethes** Hesse

– Hair thick and frayed at the ends and with dense scales on the body; sand-chamber absent; gonostyli long, narrow .... **Lepidochlaenus** Hesse

15 Posterior margin of eyes indented; claws of males toothed; gonocoxae constricted in middle .... **Efflatounia** Bezzi

– Posterior margin of eyes entire; claws usually without a tooth, or a tooth present in both sexes 16

16 Scape markedly swollen, barrel-shaped; gonostyli long and sinuous 17

– Scape about equal in diameter to pedicel, if somewhat swollen then hind-femora with a row of strong but short bristles beneath; gonostyli usually broad, leaf-like or with a ventral spine, not long and leaf-like 20

17 Face bare and shining; hind-femora with a row of strong bristles beneath .... **Sisyrophanus** Karsch

– Face with hair or, if bare, tomentose; hind-femora without a row of bristles beneath 18

18 Small, less than 5 mm in length; male holoptic; palpi two-segmented .... **Conophorina** Becker

– Medium to large, over 5 mm in length; males dichoptic; palpi one-segmented ...19

19 Wing narrowed at base, alula reduced, cell r_5 usually open: hair long and coarse with a rough appearance .... **Dischistus** subgenus **Dischistus** Loew

– Wing broad at base, alula well developed, cell r_5 closed; hair dense and silky with a clipped appearance .... **Dischistus** subgenus **Acanthogeron** Bezzi

20 Wing narrow at base, costal comb not developed, cell r_5 broadly open 21

– Wing broad at base, costal comb well developed, cell r_5 closed or only narrowly open 23

21 Males holoptic; elongate narrow-bodied flies; gonostyli with a ventral spine, no distinct epiphallus (Fig. 103) .... **Gonarthrus** Bezzi

– Males dichoptic; broad-bodied flies with a short rounded abdomen; gonostyli leaf-shaped and pointed, epiphallus large 22

22 Flagellum markedly broad and with long hairs; interradial vein present (three submarginal cells), wing pilose at base .... **Sosiomyia** Bezzi

– Antenna normal, third segment narrow and without long hairs; interradial vein absent (two submarginal cells), wing base not pilose............ **Adelidea** Macquart

23 Cell r_5 long and pointed or narrowly open at wing margin; abdomen elongate ...... **Neobombylodes** Evenhuis

– Cell r_5 closed and with the terminal segment of R_5 as long as the penultimate segment; abdomen broad 24

24 Abdomen round with a bee-like banded pattern of short hair-like scales; claws toothed; pulvilli absent .... **Zinnomyia** Hesse

– Abdomen ovate without a bee-like pattern; claws not toothed; pulvilli present ... 25

25 Hind-femora without a row of bristles on the underside; body *Nemestrinus*-like with short sparse hair and cuticle with a pattern of dark and pale areas; gonostyli thick, round in section, phallosome robust .... **Isocnemus** Bezzi

– Hind-femora with a row of bristles on the underside; body not *Nemestrinus*-like but with long shaggy hair (Fig. 75); gonostyli flat, leaf-like, phallosome slender, pointed 26

26 Cell br longer than bm (Fig. 80); palpi with two segments .... **Australoechus** Greathead

– Cell br equal in length to bm (Fig. 75); palpi with one segment .... **Anastoechus** Osten Sacken

Adelidea Macquart

Adelidea Macquart, 1840: 84 [1841: 362]. Type species: *Adelidea fuscipennis* Macquart, 1840 [= *Bombylius anomalus* Wiedemann, 1821], by original designation.

Sobarus Loew, 1855: 6, 39 (as subgenus of *Bombylius* Linnaeus). Type species: *Bombylius anomalus* Wiedemann, 1821, by original designation.

Comments: *Adelidea* forms a clade with *Sosiomyia* in all cladograms found for the genera of Bombyliini (Greathead unpublished). The only important characters separating them are those used in the key:

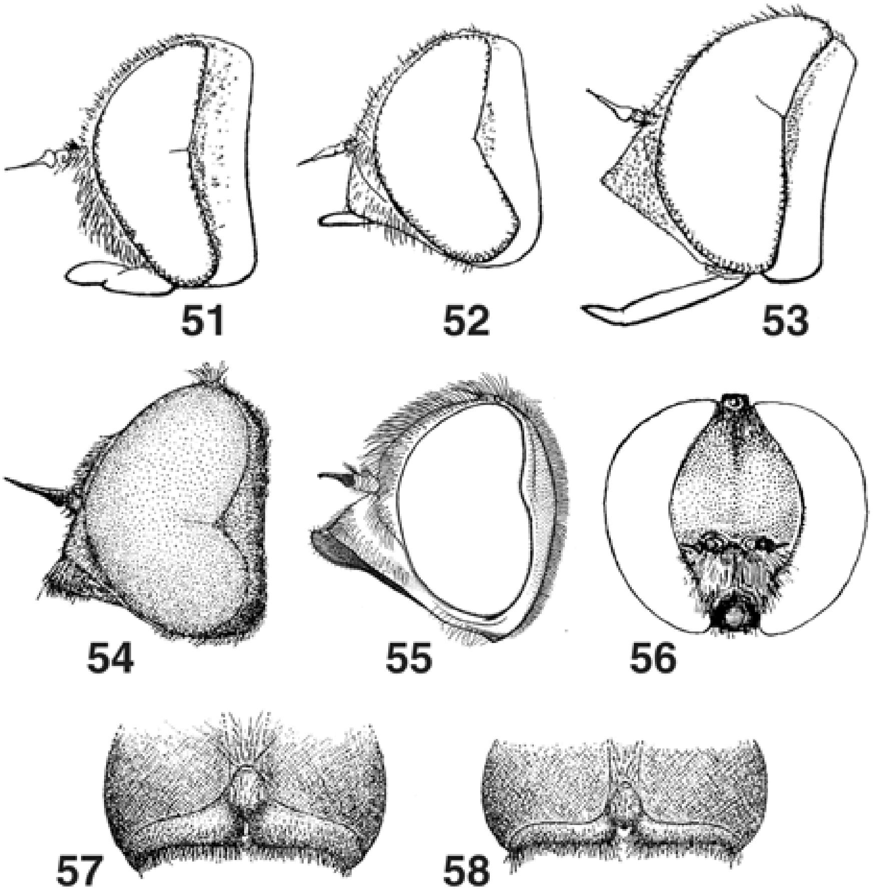
Key: Hesse (1938).

Distribution: Southern Africa: Eastern and Western Cape: 8 species.

Anastoechus Osten Sacken

Anastoechus Osten Sacken, 1877: 251. Type species: *Anastoechus barbatus* Osten Sacken, 1877, by monotypy.

Comments: This genus, formerly considered to be closely allied to *Bombylius* and *Systoechus,* has been shown to have bare laterotergites (Greathead 1995). It is close to the southern African genus *Australoechus* Greathead and forms a clade with it in all



Figs 51–56. (Figs 51–56) Bombyliidae heads, lateral view. 51. *Villa hottentotta* (Linnaeus). 52. *Pachyanthrax* sp. 53. *Exhyalanthrax muscarius* (Pallas) [all from Greathead 1981]. 54. *Pteraulacodes karooensis* Hesse. 55. *Stomylomyia europaea* (Loew) [all from Hesse 1956]. 56. *Desmatoneura nivea* (Rossi) (from Engel 1936). (Figs 57–58) Bombyliidae heads, dorsal view (from Hesse 1956). 57. *Plesiocera psammophila* Hesse. 58. *Conomyza semirufella* Hesse.

cladograms found for the genera of Bombyliini (Greathead unpublished). In addition to the characters in the key, *Anastoechus* differs from *Australoechus* Greathead in the male genitalia which has the phallosome attached near the base of the gonocoxae and not near the middle.

Key: Palaearctic, Engel (1932–7), Paramonov (1940*b*); Egypt, Efflatoun (1945); Afrotropical, Bezzi (1924); southern Africa, Hesse (1938).

Hosts: African species have not been reared, but some Holarctic species are predators in egg-pods of Acrididae (Greathead 1963; du Merle 1975).

Distribution: Holarctic, Afrotropical and Oriental (1 species only) Regions (Greathead 1995). North Africa: 11 species. Canary Islands: 1 species, *Anastoechus latifrons* (Macquart). Africa South of the Sahara: 32 species, mostly from South Africa and the northern semi-desert areas.

Australoechus Greathead

Australoechus Greathead, 1995: 61. Type species: *Bombylius micans* Fabricius, 1798, by original designation.

Comments: Greathead (1995) showed that the *Bombylius micans* group of Bezzi (1924), Group 3 of Hesse (1938), have bare laterotergites and so belong a new genus. They resemble *Anastoechus* spp. *inter alia* in the broad head and shaggy, bristly vestiture, but differ from this genus in the placement of vein r-m and the attachment of the phallosome to the middle of the gonocoxae. In phylogenetic analyses *Australoechus* always forms a terminal clade with *Anastoechus* (Greathead unpublished).

Key: Hesse (1938) as *Bombylius* Group 3.

Distribution: South Africa: principally the Northern and Western Cape but extending into the Eastern Cape and Namibia and with 1 species in the Northern Province: 29 species.

Beckerellus Greathead

Beckerellus Greathead, 1995: 57. Type species: *Bombylius terminatus* Becker, 1909, by original designation.

Comments: The genus *Beckerellus* was proposed for a group of anomalous species in which there is convergence in the external characters of the sexes. The narrow frons and elongate cerci of the females have caused confusion between sexes. The enlargement of the anterior facets of the eyes and tubular ovipositor of the female, and the large pigmented eggs, suggest that the eggs are accurately placed on the substrate rather than ejected onto the soil surface as in other Bombyliinae. However, oviposition has not been observed and there are no rearing records for any of the species of this genus.

Keys: The species are included in keys to *Bombylius* spp.: Palaearctic, Engel (1932–7); Afrotropical, Bezzi (1924).

Distribution: Africa, southern Europe to Iran. Africa South of the Sahara: 3 species; *Beckerellus melanopus* (Bezzi) (Kenya And Uganda), *B. obtusus* (Bezzi) (Northern Ethiopia), *B. terminatus* (Becker) (Savanna Regions).

Bombomyia Greathead

Bombomyia Greathead, 1995: 56. Type species: *Bombylius discoideus* Fabricius, 1794, by original designation.

Comments: The genus *Bombomyia* was proposed for the *Bombylius analis* (= *discoideus*) group of Bezzi (1924), Hesse's (1938) Group 1 Section 2. They are all large, broad-bodied flies with brightly coloured hair, and bear some resemblance to bees of the genera *Bombus* and *Anthophora*.

Keys: Palaearctic, Engel (1932–7 in key to *Bombylius* spp.); Afrotropical, Paramonov (1955 as *Bombylius discoideus* group); Eritrea/northern Ethiopia, Greathead (1967 in key to *Bombylius* spp.); southern Africa, Hesse (1938 as *Bombylius* Group 1, Section 2).

Distribution: Africa, southern Palaearctic, India. North Africa: 2 species; *Bombomyia sticticus* (Boisduval), *B. discoideus* (Fabricius) (one of the most widespread Bombyliidae, found from South Africa to Southern Europe and the Caucasus). Africa South of the Sahara: 18 species.

Bombylella Greathead

Bombylella Greathead, 1995: 56. Type species: *Bombylius ornatus* Wiedemann, 1828, by original designation.

Comments: This genus corresponds to the *Bombylius ornatus* group of Bezzi (1924), Group 1 Section 3 of Hesse (1938). It is a predominantly African genus of rather slender, delicately built flies, mostly associated with dense savanna or forest vegetation.

Keys: Palaearctic, in keys to *Bombylius* spp., Engel (1932–7), Paramonov (1940*b*); Egypt, Efflatoun (1945 in key to *Bombylius* spp.); Afrotropical, Greathead (1999*a*).

Hosts: There are two records from South Africa of rearings from the dung balls of Scarabaeidae (Cambefort 1982).

Distribution: North Africa: Egypt: 2 species; *Bombylella atra* (Scopoli), *B. pseudargentata* (Paramonov). Africa South of the Sahara: 16 species.

Bombylisoma Rondani

Bombylisoma Rondani, 1856: 164. Type species: *Bombylius sulphureus* Fabricius, 1805 [= *Bombylius minimus* Scopoli, 1771, by original designation.

Chasmoneura Hesse, 1938: 586. Type species: *Bombylius argyropygus* Wiedemann, 1821, by original designation.

Comments: Palaearctic species were included in the genus *Dischistus* owing to the mistaken acceptance by many authors of the designation of *Bombylius minimus* Schrank as genotype by Brunetti (1920), which, in fact, postdated the designation of *B. mystax* Wiedemann as genotype by Becker (1913). The confusion led Hesse (1938) to propose a new genus *Chasmoneura* for South African species, in ignorance of the availability of the name *Bombylisoma* Rondani (see Bowden 1973). They are similar in habitus to *Bombylella* spp., and are encountered in similar habitats.

Keys: Palaearctic, Engel (1932–7), Paramonov (1940*b*), both as *Dischistus*; Afrotropical, Greathead (1996*b*).

Distribution: North Africa: 7 species. Africa South of the Sahara: 21 species, including a new species *Bombylisoma album* Greathead (2000*a*) from Namibia and *B. microlepidum* from Madagascar.

Bombylius Linnaeus

Bombylius Linnaeus, 1758: 606. Type species: *Bombylius major* Linnaeus, 1758, by subsequent designation (Latreille, 1810: 443).

Comments: Greathead (1995) showed that most species of *Bombylius sensu lato* in Africa belong to other genera. As now defined, it is predominantly a Holarctic genus, represented in the Afrotropical Region principally by the *Bombylius neithokris* series and the *B. modestus* series of Bezzi (1924). The little-known Group 1 Section 4 of Hesse (1938), comprising four species from Namibia and the Karoo, may also belong.

Keys: Palaearctic, Engel (1932–7), Paramonov (1940*b*); Egypt, Efflatoun (1945); southern Africa, Hesse (1938); *Bombylius neithokris* group (Greathead 1991*b*) and *B. modestus* group (Greathead 1967 but note changes in nomenclature).

Hosts: Afrotropical species have not been reared, but several Holarctic species are known as predators in the nests of solitary bees (du Merle 1975).

Subgenus *Bombylius* Linnaeus

Distribution: Holarctic, Afrotropical and Oriental Regions (Greathead 1995). North Africa: about 26 species. Canary Islands: 3 species; *B. aaroni* Báez, *B. oceanus* Becker, *B. pintaurius* Báez. Africa South of the Sahara: 22 species, including *B. neithokris* group, 10 species (South Africa – Egypt), and *Bombylius modestus* group, 7 species, (Sahel – Arabia). Socotra: 2 species; *B. socotrae* Greathead, *B. terminatus* Becker.

Subgenus *Zephyrectes* Evenhuis

Zephyrectes Evenhuis, 1978*a*: 33. Type species: *Bombylius anthophoroides* Evenhuis, 1977, by original designation.

Distribution: Holarctic. North Africa: 3 species; *Bombylius cinerarius* Pallas & Wiedemann (Egypt), *B. cruciatus* Fabricius (Egypt, Morocco), *B. leucopygus* Macquart (Algeria, Morocco).

Conophorina Becker

Conophorina Becker, 1920: 181. Type species: *Conophorina bicellaris* Becker, 1920, by monotypy.

Comments: A monotypic genus resembling a small *Dischistus*.

Distribution: Monotypic. South Africa: Eastern and Western Cape: *Conophorina bicellaris* Becker.

Dischistus Loew

Dischistus Loew, 1855: 45 (as subgenus of *Bombylius* Linnaeus). Type species: *Bombylius mystax* Wiedemann, 1818, by subsequent designation (Becker, 1913: 494).

Comments: Hesse (1938) correctly recognised the South African species *D. mystax* (Wiedemann) as genotype, and that *Dischistus* is very close to its Mediterranean counterpart, *Acanthogeron*, which Bowden (1973) formally reduced to a subgenus of *Dischistus*. It has since been regarded as a synonym of *Dischistus,* but as *Acanthogeron* spp. differ in wing venation and vestiture, and are therefore readily separated, it is convenient to recognise *Acanthogeron* as a subgenus. *Dischistus sensu stricto* all have a brown vestiture composed of long upright hair, but *D.* (*Acanthogeron*) spp. have much shorter and denser, pale hair.

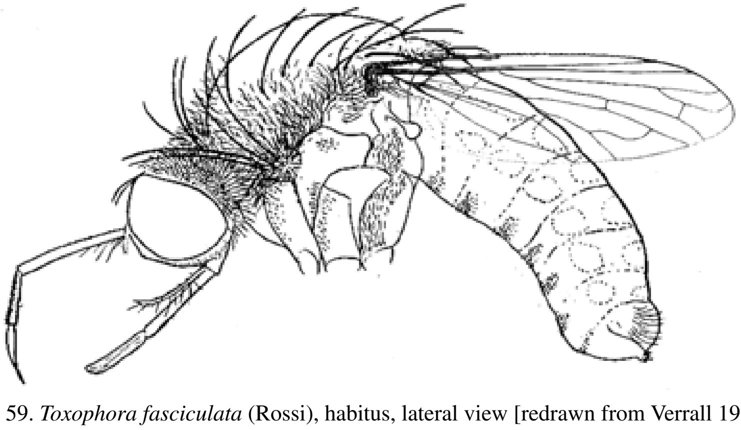


Fig. 59. *Toxophora fasciculata* (Rossi), habitus, lateral view [redrawn from Verrall 1909].

Subgenus *Dischistus* Loew

Key: Southern Africa, Hesse (1938).

Distribution: Africa South of the Sahara: South Africa: 6 species: Kenya: 1 species; *Dischistus holopticus* Greathead. Distribution map in Greathead (1997).

Subgenus **Acanthogeron** Bezzi, stat. rev.

Acanthogeron Bezzi, 1925: 164. Type species: *Bombylius senex* Meigen, 1820, by original designation.
Lissomerus Austen, 1937: 33. Type species: *Lissomerus niveicomatus* Austen, 1937, by original designation.

Key: Engel (1932–7), Paramonov (1940*b*), and Egypt, Efflatoun (1945).

Distribution: Mediterranean Basin. North Africa: 13 species. Canary Islands: 1 species; *Dischistus* (*A.*) *atlanticus* Santos Abreu.

Doliogethes Hesse

Doliogethes Hesse, 1938: 545. Type species: *Bombylius seriatus* Wiedemann, 1821, by original designation.

Comments: *Doliogethes* was proposed for those members of *Dischistus* Group 3 of Bezzi (1924) which have dichoptic males, a tendency to reddening of the cuticle, and entirely pale bristles on the legs.

Key: Hesse (1938).

Distribution: Africa South of the Sahara: 17 species, mostly South Africa (Eastern, Northern and Western Cape) but reaching Namibia, and Zambia: 1 species.

Efflatounia Bezzi

Efflatounia Bezzi, 1925: 168, 169, 170. Type species: *Efflatounia aegyptiaca* Bezzi, 1925, by original designation.

Comments: The species are *Dischistus*-like in habitus.

Distribution: North Africa and Arabia: 2 species; *Efflatounia aegyptiaca* Bezzi (Egypt), *E. berbera* Bowden (Algeria).

Eremyia Greathead

Eremyia Greathead, 1996*a*: 15. Type species: *Chasmoneura argentata* Greathead, 1967, by original designation.

Comments: *Eremyia* was proposed for three species, formerly in *Bombylisoma*, from the eastern half of the Eremian Region, which form a terminal clade with *Bombylisoma* in phylogenetic analyses (Greathead unpublished). They are readily separated by from it by the vestigial pulvilli and silver-scale spots on either side of the antennae in both sexes.

Key: Included in key to afrotropical *Bombylisoma* spp. (Greathead 1996*b*).

Distribution: Caucasus to Central Asia, India and northeast Africa. Afrotropical: Eritrea: 1 species *Eremyia argentata* (Greathead).

Eurycarenus Bezzi

Eurycarenus Loew, 1860*a*: 83 [1860*b*: 258; 1860*c*: 186]. Type species: *Bombylius laticeps* Loew, 1852, by monotypy.

Comments: A very distinctive genus, at once recognised by the pattern of black, white and yellow vestiture, numerous black bristles, and broad head with indented hind margins of the eyes.

Keys: Afrotropical, Bezzi (1924); southern Africa, Hesse (1938); West Africa, Bowden (1964).

Distribution: Afrotropical and India. Africa South of the Sahara: 14 species; India*:* *Eurycarenus erectus* (Brunetti).

Gonarthrus Bezzi

Gonarthrus Bezzi, 1921*a*: 88 [1923: 324; 1924: 109]. Type species: *Dischistus cylindricus* Bezzi, 1906, by original designation.

Comments: *Gonarthrus* spp. are narrow-bodied flies with long, white to yellowish hair, and are very uniform in appearance, recalling *Geron* spp. with which they have been confused on occasion, notably by Efflatoun (1945) who described *Gonarthrus longibarbus* as a species of *Geron*.

Keys: Afrotropical, Bezzi (1924); southern Africa, Hesse (1938).

Distribution: Afrotropical Region, North Africa and Arabia. North Africa: 1 species; *Gonarthrus longibarbus* (Efflatoun). Africa South of the Sahara: 31 species.

Isocnemus Bezzi

Isocnemus Bezzi, 1924: 101. Type species: *Isocnemus nemestrinus* Bezzi, 1924, by original designation.

Comments: The single representative of this genus bears a strong resemblance to species of *Nemestrinus* in shape, vestiture and colour.

Distribution: Monotypic. Ethiopia: Ogaden: *Isocnemus nemestrinus* Bezzi.

Lepidochlanus Hesse

Lepidochlanus Hesse, 1938: 613. Type species: *Lepidochlanus fimbriatus* Hesse, 1938, by original designation.

Comments: This monotypic genus segregates with *Doliogethes* close to *Dischistus*.

Distribution: Monotypic. Namibia, Western South Africa: *Lepidochlanus fimbriatus* Hesse.

Neobombylodes Evenhuis

Bombylodes Paramonov, 1940*b*: 65. Type species: *Dischistus multisetosus* Loew, 1857, by original designation. [Preoccupied by Fauvel, 1904.]

Neobombylodes Evenhuis, 1978*b*: 247 (new replacement name for *Bombylodes* Paramonov, 1940). Type species: *Dischistus multisetosus* Loew, 1857, automatic.

Comments: The species are similar in appearance to *Dischistus* (*Acanthogeron*) spp., and were included in it by Engel (1932–7) although the laterotergites are bare.

Key: Engel (1932–7 as *Dischistus*), Paramonov (1940*b* as *Bombylodes*).

Distribution: North Africa and Iran. North Africa: 3 species; *Neobombylodes eximius* (Becker), *E. giganteus* (Villeneuve), *N. multisetosus* (Loew).

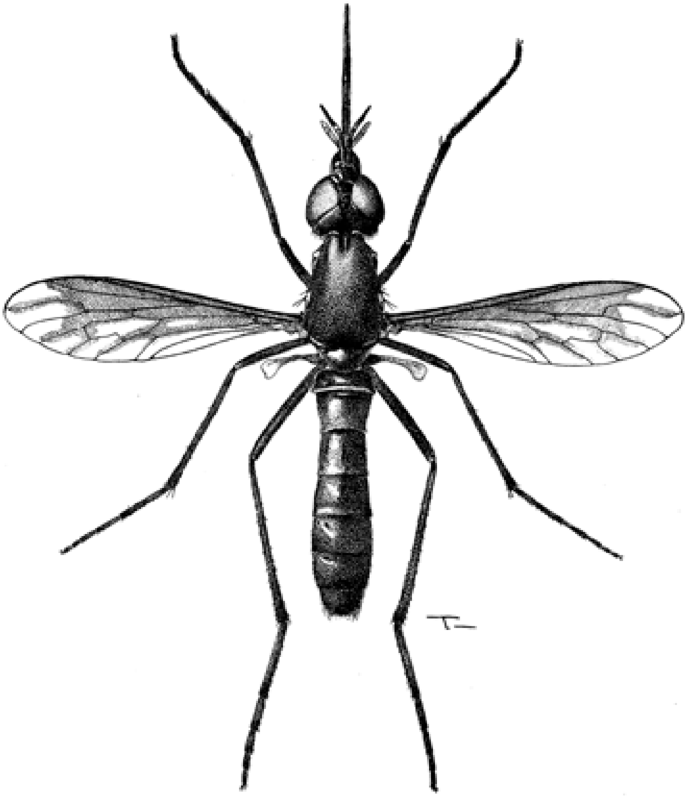


Fig. 60. *Eclimus gracilis* Loew, female habitus (from Austen 1937).

Parisus Walker

Parisus Walker, 1852: 196. Type species: *Parisus paterculus* Walker, 1852, by monotypy.

Comments: The genus *Parisus* Walker was revived by Greathead (1995) for the majority of species in the *Bombylius mundus* group of Bezzi, Group 2 of Hesse (1938 1961). It is predominantly a southern African genus of species with pale bristles on the legs and mainly pale vestiture.

Key: Afrotropical, Bezzi (1924 as *Bombylius mundus* group); Southern Africa, Hesse (1938 as *Bombylius* Group 2).

Distribution: Africa and south-western Asia. Africa South of the Sahara: 45 species confined to southern Africa: Eastern Africa: 2 species; *Parisus luteipennis* (Bezzi) and *P. pangoniiformis* Greathead.

Sisyrophanus Karsch

Sisyrophanus Karsch, 1886: 53. Type species: *Sisyrophanus homeyeri* Karsch, 1886, by monotypy.

Comments: The wings are similar to those of *Eurycarenus* spp., and like them the head is broad and the body elongate, but they differ in the colour of the vestiture, and in having few bristles and entire hind margins of the eyes.

Key: Greathead (1997).

Distribution: Botswana To Kenya: 8 species.

Sosiomyia Bezzi

Sosiomyia Bezzi, 1921*a*: 67. Type species: *Sosiomyia comata* Bezzi, 1921 (as '*carnata*'), by original designation.

Comments: Very similar to *Adelidea,* and always forming a terminal clade with it in phylogenetic analyses, but with the flagellum broadened and with strong hairs.

Distribution: Monotypic. South Africa: Northern Cape: *Sosiomyia comata* Bezzi.

Systoechus Loew

Systoechus Loew, 1855: 5, 34 (as subgenus of *Bombylius* Linnaeus). Type species: *Bombylius sulphureus* Mikan, 1796 [= *Bombylius ctenopterus* Mikan, 1796], by subsequent designation (Coquillett, 1910: 611).

Comments: *Systoechus* is the sister group of *Bombylius*, but easily recognised by its distinctive colouration and different phallosome.

Keys: Palaearctic, Engel (1932–7), Paramonov (1940*b*); Afrotropical, Bezzi (1924); East Africa, Greathead (1996*c*); Eritrea/northern Ethiopia, Greathead (1967); southern Africa, Hesse (1938); West Africa, Bowden (1964).

Hosts: All reared species are predators of the eggs of Acridoidea (Greathead 1963; du Merle 1975; Yeates & Greathead 1997).

Distribution: Holarctic, Afrotropical and Oriental Regions. North Africa: 6 species. Africa South of the Sahara: 92 species. Madagascar: 1 species; *S. claripennis* (Macquart). Socotra: 1 species; *S. somali* Oldroyd.

Triplasius Loew

Triplasius Loew, 1855: 7 (as subgenus of *Bombylius* Linnaeus). Type species: *Bombylius bivittatus* Loew, 1855, by monotypy.

Comments: This genus was revived (Greathead 1995) for a group of species sharing an unstable wing venation and a striking colour pattern, placed in his Group 1 Section 1 by Hesse (1938). The interradial vein is complete (three submarginal cells) in the type species, *T. bivittatus*.

Keys: Palaearctic, Engel (1932–7), Paramonov (1940*b*) in keys to *Bombylius* spp; southern Africa. Hesse (1938 as *Bombylius* Group 1 Section 1).

Distribution: South Africa, North Africa and Europe-Caucasus. North Africa: 2 species; *T. boghariensis* (Lucas), *T. maculipennis* (Macquart). South Africa: 4 species; *Triplasius bivittatus* Loew, *T. lateralis* (Fabricius), *T. namaquensis* (Hesse), *T. tinctus* (Walker).

Xerachistus Greathead

Xerachistus Greathead, 1995: 60. Type species: *Bombylius acutus* Bezzi, 1924, by original designation.

Comments: Greathead (1995) showed that certain species of Hesse's Group 2 have an open or nearly open cell r_5, broad head and relatively narrow body, short vestiture and different male genitalia, warranting their transfer to a new genus.

Key: Southern Africa, Hesse (1938 included in key to *Bombylius* Group 2).

Distribution: Afrotropical extending to Oman. Africa South of the Sahara: 5 species *Xerachistus atronotatus* (Hesse) (Namibia), *X. mundus* (Loew) (Northern Cape), *X. rhomboidalis* (Hesse) (Namibia), *X. sessilis* (Bezzi) (Northern Cape, Namibia), *X. acutus* (Bezzi) (Mali to Somalia).

Zinnomyia Hesse

Zinnomyia Hesse, 1955: 387. Type species: *Zinnomyia karooensis* Hesse, 1955 [= *Bombylius bifidus* Bezzi, 1924], by original designation.

Comments: The genus *Zinnomyia* was proposed by Hesse (1955) for two species with a striking tabanid-like appearance. He remarked on the fact that one of them was collected at a much visited site on a single occasion only, and speculated that it must either be very rare or have a very short flight period. The paucity of specimens of these striking flies in collections suggests that the species are indeed rare, but as specimens of the same species have been collected at widely separated localities, it seems that they are nonetheless widespread.

Distribution: Afrotropical Region. Africa South of the Sahara: 3 species *Zinnomyia bifida* (Bezzi) (Eastern & Western Cape), *Z. brincki* Hesse (Namibia, ?Kenya), *Z. mira* Greathead (Mali, Niger).

Conophorini Becker

Type genus: *Conophorus* Meigen, 1803.

The Conophorini are distinguished from other Bombyliinae by the expanded radial area of the wing and discal cell at apex owing to cell m_2 being short and quadrate. Mid-tibial spurs are present in some genera, and a shining, bilobate scutellum is sporadically present. Males may have spines on the costa, and have very uniform genitalia with a simple conical phallosome. The spermathecae are strikingly different in the various genera.

Key to the genera of Conophorini

1 Flagellum with two flagellomeres subequal in length, the first broad and the second narrow, rod-like; mid-tibial spurs present; interradial vein present (3 submarginal cells) (Fig. 84); wing glassy hyaline; scutellum bilobate, shining at apex; body compact, humped, acrocerid-like; males dichoptic with eyes separated by more than width of median ocellus .... **Othniomyia** Hesse

– Flagellum with a large first flagellomere, second small or minute; mid-tibial spurs present or absent; interradial vein usually absent; wing not glassy hyaline, at least with a feint basal infuscation but often with an extensive infuscation; scutellum rarely bilobate, shining at apex, if so body elongate (*Conophorus mauritanicus* Bigot); body not humped or acrocerid-like; males holoptic or with eyes separated at vertex by no more than the width of the median ocellus 2

2 Scape greatly swollen, longer than pedicel and flagellum combined (Fig.63); mid-tibial spur present; interradial vein present in some species (2 or 3 submarginal cells); abdomen elongate ovate; body hair long; males holoptic .... **Conophorus** Becker

– Scape at most only moderately swollen, shorter than pedicel and flagellum combined; mid-tibial spur absent; interradial vein absent (2 submarginal cells);

abdomen elongate ovate or short and broad; body hair short, sparse with abdomen often almost bare; males with eyes narrowly separated 3

3 Scape moderately swollen, first flagellomere bare, frequently broad and dorsoventrally flattened; wing with an extensive dark mottled pattern, including dark spots at middle of cells (Fig. 85); abdomen elongate; body uniformly dark blackish .... **Prorachthes** Loew

– Scape not swollen, wing hyaline or with a basicostal infuscation tending to be more intense along the margins of veins, and more extensive in females; abdomen broad; body sometimes with pale markings 4

4 Mouthparts normally developed, proboscis extending beyond the oral cavity; first flagellomere with a few hairs on the dorsal surface, lanceolate; sclerotisation of first tergum interrupted medially .... **Legnotomyia** Bezzi

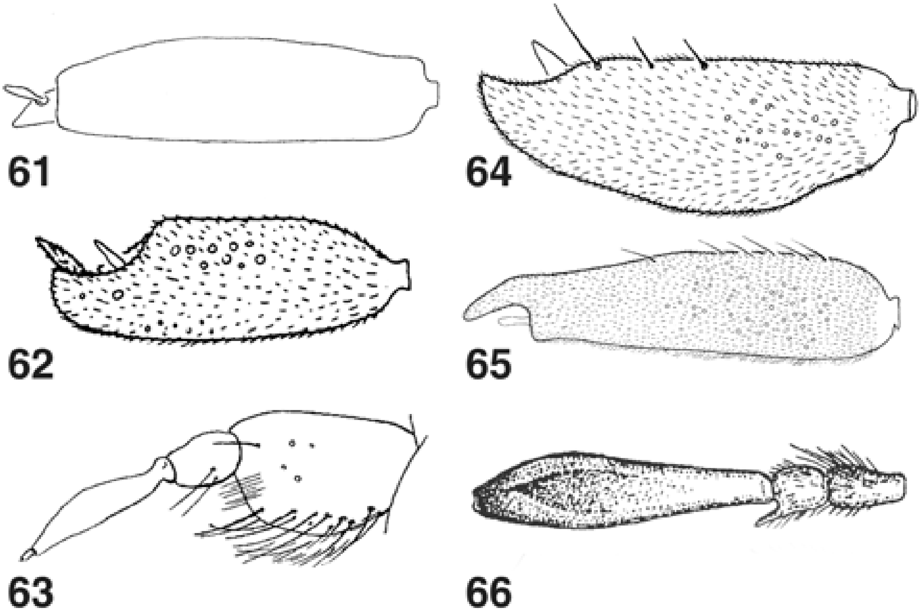
– Mouthparts vestigial, proboscis concealed in oral cavity; first flagellomere without hairs, leaf-shaped; sclerotisation of first tergum not interrupted medially ....
Notolegnotus Greathead and Evenhuis, gen. n.

Conophorus Meigen

Conophorus Meigen, 1803: 268. Type species: *Bombylius maurus* Mikan, 1796 [= *Bombylius virescens* Fabricius, 1787], by monotypy.

Ploas Latreille, 1804: 190. Type species: *Ploas hirticornis* Latreille, 1805 [= *Bombylius virescens* Fabricius, 1787], by subsequent monotypy (Latreille, 1805: 300).

Tornotes Gistel, 1848: x (unjustified new replacement name for *Ploas* Latreille, 1804). Type species: *Ploas hirticornis* Latreille, 1805 [= *Bombylius virescens* Fabricius, 1787], automatic.



Figs 61–66. Bombyliidae antennae. 61. *Oligodranes* sp. 62. *Apolysis flavifemoris* (Hesse). 63. *Conophorus flavescens* (Meigen). 64. *Usia versicolor* (Fabricius). 65. *Phthiria gaedii* Wiedemann. 66. *Hyperusia soror* Hesse. [Figs 61, 62, 64, 65 from Evenhuis 1990*a*; Fig. 63 from Engel 1932; Fig. 66 from Hesse 1938.]

Comments: The species of this genus tend to be rather uniform in appearance, as are the male genitalia, making identification of some species difficult. The spermathecae have small, ovoid bulbs and very long ducts. Most palaearctic species lack a distinct wing pattern, but *C. macroglossus* (Dufour) (Morocco) has extensive markings, similar to those found in *Prorachthes* spp.

Key: Engel (1932–7), Paramonov (1940*b*).

Hosts: Reared on two occasions from pupae found in soil, but no host association (du Merle 1975).

Distribution: Holarctic. North Africa: 11 species.

Legnotomyia Bezzi

Legnotus Loew, 1855: 6, 41 (as subgenus of *Bombylius* Linnaeus). Type species: *Bombylius trichorhoeus* Loew, 1855, by original designation. [Preoccupied by Schiødte, 1848.]

Legnotomyia Bezzi, 1902: 191 (replacement name for *Legnotus* Loew, 1855). Type species: *Bombylius trichorhoeus* Loew, 1855, automatic.

Psiatholasius Becker, 1906: 145. Type species: *Psiatholasius bombyliiformis* Becker, 1906, by original designation.

Comments: Species of *Legnotomyia* are very bare, have a characteristic broad, rounded abdomen with, in most instances, a banded pattern, and the sclerotisation of the first tergum is interrupted medially. The wing infuscation is sexually dimorphic, being more intense and restricted in area in males. Spermathecae narrow, tubular, with short ducts.

Key: Palaearctic, Engel (1932–7), Paramonov (1947)

Distribution: Western Palaearctic, Eastern Africa. North Africa: 3 species; *Legnotomyia singularis* (Macquart), (Algeria, Tunisia), *L. fascipennis* Bezzi (Egypt), *L. leyladea* Efflatoun (Egypt). Africa South of the Sahara: Kenya, Tanzania: 1 species; *L. striata* (Bischof).

Notolegnotus Greathead and Evenhuis **gen. n.**

Type species *Notolegnotus brevis* sp. n.

A single female specimen from Namibia, superficially like a *Legnotomyia* sp., is remarkable in having vestigial mouthparts. On close examination, it also differs from *Legnotomyia* in having a leaf-shaped antennal flagellum without any long hairs, face not projecting, fine hairs on the laterotergite, and first abdominal tergum not interrupted medially. Although the specimen lacks the right wing and has only the left mid and hind legs remaining, it is described here because it represents a new genus clearly allied to the predominantly palaearctic genus *Legnotomyia*. It is also of zoogeographical significance in providing a further example of the link between the Namibian fauna and that of north-eastern Africa.

Description: *Head:* Relatively small, about 1.5 x as wide as high; occiput not inflated; frons with a deep central depression in female; face not produced. With short fine hairs on occiput, ocellar triangle and coarse hairs at sides of face. Antenna with scape about 1.5 x as wide as long, pedicel similar, both with short coarse hairs below; first flagellomere leaf-shaped, laterally flattened and covered in minute spicules, truncate at apex, and with a minute second flagellomere and transparent style. Proboscis, short but robust, not projecting beyond oral cavity, underside with hairs. Labella reduced in size, appearing as a small apical swelling. Palpi very small, knob-like. *Thorax*: Broad and deep, almost bare but with scattered scales and fine hair on propleura and laterotergites only. *Legs*: Femora with scattered decumbent scales only, tibiae and tarsi spiculate. Claws bent at tips, pulvilli well developed. *Wing*: Similar to *Legnotomyia*, but R_4 very straight and curved only just before it reaches costa. *Abdomen*: Short and broader than thorax, First tergum not interrupted medially as in *Legnotomyia*. Fine hair present on first tergum and sparse scales on remaining terga.

Notolegnotus brevis Greathead and Evenhuis **sp. n.**

Material examined: Holotype ♀. NAMIBIA: 36 km S Khorixas Road 76, 20°34'S 14°52'E, 26.iii.1984 (Stuckenberg & Londt) (roadside flowering shrubs (purple)) (in NMSA).

Description: *Head*: Black except for oral cavity, brown. Hair on occiput translucent whitish, that on ocellar triangle and face gleaming gold, scales gold. Antennae brown. Proboscis dark brown. *Thorax*: Brown, darker on dorsal surface of mesonotum. Hair fine colourless, scales gold denser in three poorly indicated longitudinal stripes on mesonotum. *Legs*: Femora brown, tibiae and tarsi yellow, spicules and scales yellow-gold. *Wing*: Hyaline with a feint smoky infuscation in the basal half of cells r_1, r_{2+3} and br, and also the extreme base of discal cell. Veins brown. Halter yellow with a paler ivory knob. *Abdomen*: Brown and with margins and reflexed sides of terga 1–6 yellow, sterna yellow. First tergum with short fine white hair, remainder with sparse gold scales.

Othniomyia Hesse

Othniomyia Hesse, 1938: 707. Type species: *Othniomyia tylopelta* Hesse, 1938, by original designation.

Comments: The compact body with the thorax humped is reminiscent of an acrocerid. Aside from its general appearance, the glassy hyaline wings and shape of the antennae distinguish it from other Conophorini. The female genitalia have not previously been described, but are normal for Bombyliinae, with a sand-chamber and acanthophorites bearing spines. The spermatheca lacks end plates on the pump and a distinct bulb; distal to the pump the long tubular duct ends in a narrow curl.

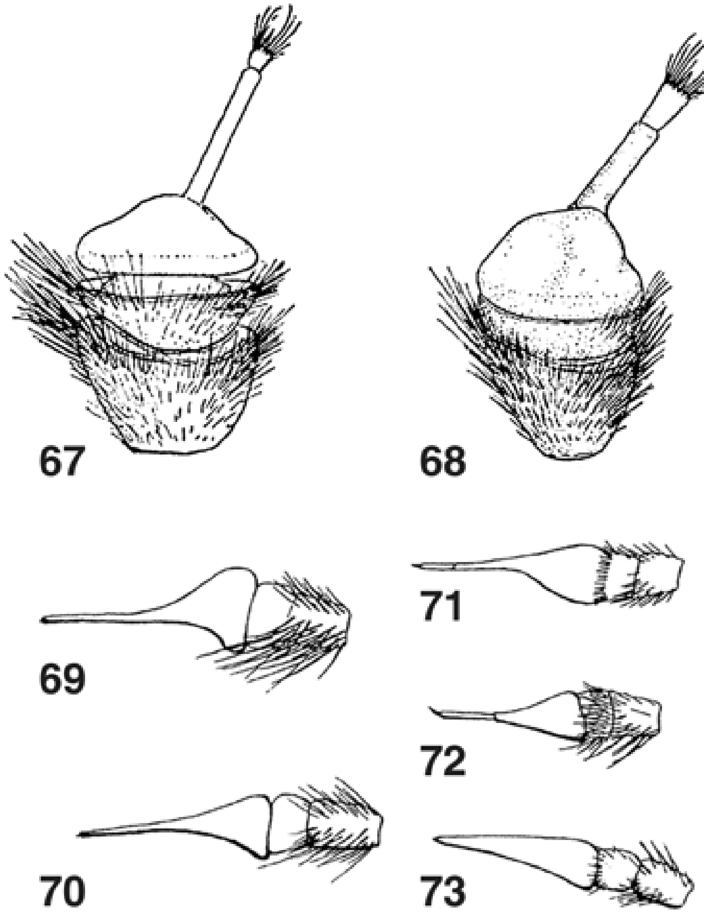
Distribution: Monotypic. South Africa: Western Cape: *Othniomyia tylopelta* Hesse.

Prorachthes Loew

Prorachthes Loew, 1869*a*: 381. Type species: *Prorachthes ledereri* Loew, 1868, by monotypy.
Dumontiella Séguy, 1932: 126. Type species: *Dumontiella vespertilio* Séguy, 1932, by original designation.
Cheilohadrus Hesse, 1938: 674. Type species: *Cheilohadrus conspersipennis* Hesse, 1938, by original designation.

Comments: The single southern African species, described as *Cheilohadrus conspersipennis* Hesse (1938), differs from the palaearctic species in having a narrow, spindle-shaped flagellum rather than a broad flattened one. Otherwise, the genus is readily recognised by the mottled wings and dark vestiture. The spermathecae have small, ovoid bulbs and short ducts lacking sperm pumps.

Key: Palaearctic species, Engel (1932–7), Paramonov (1940*b*).



Figs 67–73. Bombyliidae antennae. 67. *Anthrax pithecius* Fabricius. 68. *Spogostylum punctipenne* (Wiedemann) (from Hesse 1956). 69. *Villa hottentotta* (Linnaeus). 70. *Thyridanthrax perspicillaris* (Loew). 71. *Pachyanthrax* sp. 72. *Exhyalanthrax muscarius* (Pallas). 73. *Veribubo gazella* Greathead (all from Greathead 1981).

Distribution: Western Palaearctic and Southern Africa. North Africa: 3 species; *Prorachthes crassipalpis* Villeneuve (Algeria-Tunisia), *P. longirostris* Bezzi (Algeria, Egypt), *P. vespertilio* Séguy (Tunisia). Africa South of the Sahara: Eastern Cape, Namibia: 1 species; *P. conspersipennis* (Hesse).

Ecliminae Hall

Type genus: *Eclimus* Loew, 1844.

Hall (1969) reviewed the relationships of the genera included by previous authors in the subfamily Cylleniinae. He showed that *Eclimus, Thevenetimyia* and *Marmasoma* White, an Australian endemic, do not have a deeply concave occiput and so could not be retained within it. He also excluded them from the Toxophorinae, which they superficially resemble. Greathead (1988*a*) reviewed the genera of Ecliminae and compared them with the Toxophorinae, showing that the genera of Ecliminae differ both in wing venation and genitalia from this subfamily, and that certain other genera, including *Palintonus*, sometimes placed in the Toxophorinae, are members of the Ecliminae. Phylogenetic analysis placed the Ecliminae as terminal members of the Bombyliinae clade, consequently Yeates (1994) reduced the subfamily to a tribe of the Bombyliinae. He further found that the anomalous bombyliine genus *Paratoxophora* should be placed in the Ecliminae as sister genus to *Marmasoma*, based on characters of the genitalia. We have chosen to retain the Ecliminae as a subfamily since they have several synapomorphies not found in Bombyliinae (*vide* Evenhuis & Greathead 1999).

Key to genera of Ecliminae

1 Spine-like bristles present on prothorax; wing with alula developed, scales present on wing membrane .... **Palintonus** François
– No spine-like bristles on prothorax; wing with alula reduced, without scales on wing membrane 2

2 Occiput greatly swollen; body almost bare (Fig. 60); cuticle punctate, shining; oral rim smooth, shining .... **Eclimus** Loew
– Occiput not or only slightly swollen; body hairy; cuticle smooth, not shining; oral rim tomentose 3

3 Axillary cell broad; hind femora with bristles on underside; aedeagus small conical, enclosed in a sheath .... **Thevenetimyia** Bigot
– Axillary cell narrow; hind femora without bristles on underside; aedeagus very long, without a sheath .... **Paratoxophora** Engel

Eclimus Loew

Eclimus Loew, 1844: 154. Type species: *Eclimus perspicillaris* Loew, 1844, by subsequent designation (Coquillett, 1910: 536).

Eclimmus Agassiz, 1846: 134 (unjustified emendation of *Eclimus* Loew, 1844). Type species: *Eclimus perspicillaris* Loew, 1844, automatic.

Comments: This genus comprises only two species of dark brown, elongate and bare flies, very different in habitus from *Thevenetimyia*, at one time regarded as a synonym.

Key: Hall (1969).

Distribution: Mediterranean Basin. North Africa: 1 species; *Eclimus gracilis* Loew.

Palintonus François

Palintonus François, 1964*a*: 323. Type species: *Lepidophora austeni* Paramonov, 1949, by original designation.

Comments: The single described species was originally included in the New World eclimine genus *Lepidophora* Westwood, which is similar in appearance and also has scales on the wings, but François (1964*a*) showed that the African species differed in so many characters that it should be placed in his new genus, *Palintonus*.

Distribution: Afrotropical. Africa South of the Sahara: forests of Uganda and Democratic Republic Of Congo, Kinshasa: 1 species; *Palintonus austeni* (Paramonov). A second species from the Côte d'Ivoire is known only from a photograph (Lachaise & Bowden 1976).

Paratoxophora Engel

Paratoxophora Engel, 1936: 39. Type species: *Paratoxophora cuthbertsoni* Engel, 1936, by monotypy.

Comments: This monotypic genus superficially resembles *Gonarthrus* and consequently had been included in the Bombyliinae, notably by Hesse (1938). However, it differs most conspicuously in the large size, and structure of the male genitalia, and in the dark bluish-black cuticle and sparse vestiture.

Distribution: Monotypic. Southern and Eastern Africa: *Paratoxophora cuthbertsoni* Engel.

Thevenetimyia Bigot

Thevenemyia Bigot, 1875*a*: 196 [1875b: clxxiv] (as genus). Type species: *Thevenemyia californica* Bigot, 1875, by monotypy.

Thevenetimyia (as genus; justified emendation of *Thevenemyia* [by Bigot, 1892: 339]). Type species: *Thevenemyia californica* Bigot, 1875, automatic.

Epibates Osten Sacken, 1877: 268. Type species: *Epibates funestus* Osten Sacken, 1877, by subsequent designation (Coquillett, 1910: 538).

Comments: This genus is principally North American, but is represented by six species in Australia and two in the Mediterranean Basin. Unlike *Eclimus* spp., the adults are covered in hair of various colours.

Key: Hall (1969).

Hosts: There are two records of North American species reared in association with wood-boring beetles (du Merle 1975).

Distribution: Holarctic and Australia. North Africa: Algeria: 1 species; *Thevenetimyia quedenfeldti* (Engel).

Mariobezziinae Becker

Type genus: *Mariobezzia* Becker, 1913.

Bowden (1975*a*), recognising that the genera belonging to the *Corsomyza* group of Hesse (1938) have a deeply concave occiput and so could not be retained in the Bombyliinae, transferred them to the Cythereinae as the tribe Corsomyzini. Yeates (1994) raised the tribe to subfamily status as the Mariobezziinae, noting the priority of Becker (1913) for the latter name.

All members of the subfamily are robust, compact flies, often bee-like in appearance, usually encountered resting in flowers, particularly daisy-like flowers of certain Asteraceae. Individuals tend to become covered in pollen grains which become entangled in the hair.

Key to genera of Mariobezziinae, except *Dasypalpus* Macquart

1 Head with frons inflated or face very long and tumid; usually with interradial crossvein present (3 submarginal cells) 2

– Head without frons inflated or face long and tumid; interradial crossvein usually absent (2 submarginal cells), except *Corsomyza tricellulata* Hesse 4

2 Frons not inflated, face very long and tumid; antennae inserted nearer ocellar triangle than oral rim; flagellum narrow and linear; no hair tuft behind metathoracic spiracle 3

– Frons inflated; antennae inserted just above oral rim; flagellum clubbed; tuft of hair present behind metathoracic spiracle .... **Callynthrophora** Schiner

3 Hair dense in males and obvious in females .... **Gnumyia** Bezzi

– Hair sparse in both sexes, females almost bare .... **Mariobezzia** Becker

4 Oral rim raised into a prominent ridge; plumula absent; no hair tuft behind metathoracic spiracle 5

– Oral rim not raised into a prominent ridge; plumula present; hair tuft present behind metathoracic spiracle 6

5 Antennae inserted mid-way between ocellar triangle and oral rim; one or more prealar bristles present .... **Megapalpus** Macquart

– Antennae inserted immediately above oral rim; no prealar bristles .... **Zyxmyia** Bowden

6 Antennae inserted immediately above oral rim; no facial brush of stiff hairs 7

- Antennae inserted well above oral rim; facial brush of stiff hairs dense and obvious .... **Corsomyza** Wiedemann

7 Body without adpressed scale-like hairs; cell cup broadly open, anal lobe narrow and alula markedly reduced; proboscis as long as head and thorax combined ...... **Pusilla** Paramonov

– Body with dense adpressed scale-like hairs; cell cup closed or only narrowly open, anal lobe broad, alula well developed; proboscis much shorter than head and thorax combined .... **Hyperusia** Bezzi

Callynthrophora Schiner

Callynthrophora Schiner, 1868*a*: 313 [1868*b*: 139]. Type species: *Callynthrophora capensis* Schiner, 1868, by original designation.

Comments: This is a poorly known genus; the three described species are known only from the type specimens.

Key: Hesse (1938).

Distribution: South Africa: Western and Northern Cape: 3 species; *Callynthrophora capensis* Schiner, *C. hastaticornis* Hesse, *C. marginifrons* Bezzi.

Corsomyza Wiedemann

Corsomyza Wiedemann, 1820: 13. Type species: *Corsomyza simplex* Wiedemann, 1820, by original designation (on plate).

Corsomyza Jensen, 1832: 329. Type species: *Corsomyza simplex* Jensen, 1832 [preoccupied, = *Corsomyza simplex* Wiedemann, 1820], by subsequent designation (Evenhuis, 1990*a*: 63). [Preoccupied by Wiedemann, 1820.]

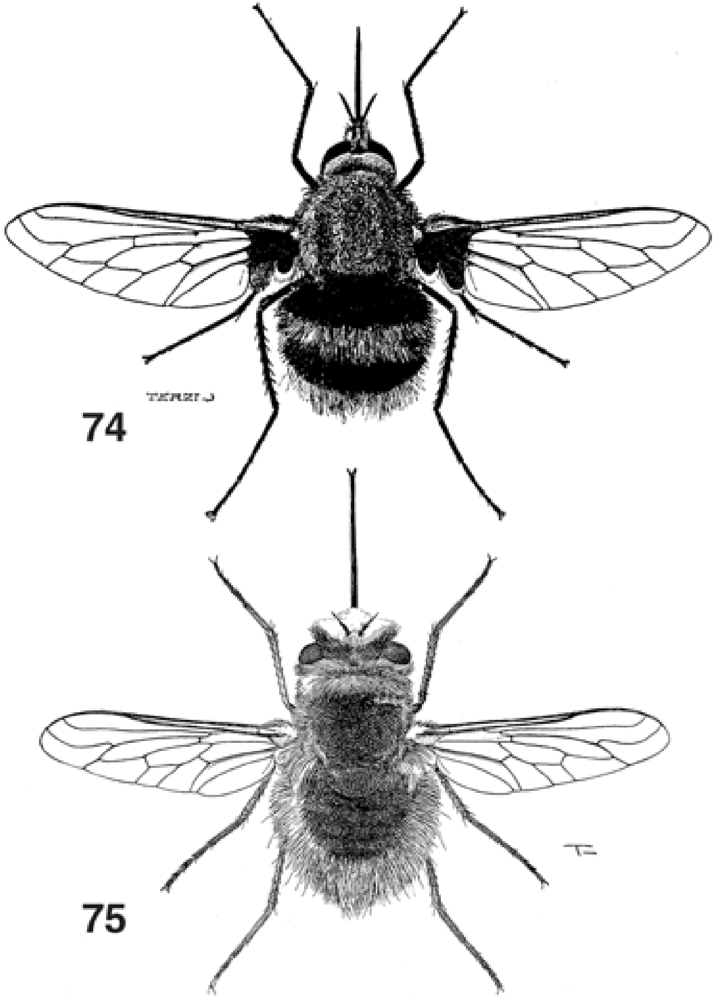
Lasioprosopa Macquart, 1855: 102(82). Type species: *Lasioprosopa bigotii* Macquart, 1855 [= *Corsomyza nigripes* Wiedemann, 1820], by monotypy.

Denamyza Hull, 1973: 164, 165 (as subgenus of *Corsomyza* Wiedemann). Type species: *Corsomyza ochrostoma* Hesse, 1938, by original designation.

Comments: *Corsomyza* spp. are found predominantly in the winter-rainfall region of southern Africa and the genus is the most speciose of the subfamily.

Key: Hesse (1938).

Distribution: Afrotropical: 27 species, with centre of diversity in South Africa, Northern



Figs. 74–75. Bombyliidae habitus drawings. 74. *Bombomyia bombiformis* (Bezzi), female (from Bezzi 1924). 75. *Anastoechus exalbidus* (Wiedemann), female (from Austen 1937).

and Western Cape, but some species occur in Namibia and the Eastern Cape, and Zimbabwe; 1 species; *Corsomyza ruficornis* Bezzi. Map (Greathead 2000*a*).

Dasypalpus Macquart

Dasypalpus Macquart, 1840: 112 [1841: 390]. Type species: *Phthiria capensis* Wiedemann, 1828 [misidentification, = *Dasypalpus capensis* Macquart, 1840, by original designation. [Not preoccupied by the *nomen nudum Dasypalpus* Rafinesque, 1815.]

Dasypalpoides Evenhuis, 1978*b*: 247 (unnecessary new replacement name for *Dasypalpus* Macquart, 1840).

Comments: The holotype and only known specimen of *Dasypalpus capensis* Macquart, the genotype of this monotypic genus, is lost. Most authors treat *Dasypalpus* as a junior synonym of *Megapalpus*, but this is speculation and may not be correct because the figures given by Macquart are not typical of *Megapalpus* (Evenhuis 1990*a*).

Distribution: Monotypic. South Africa: Western Cape: *Dasypalpus capensis* Macquart.

Gnumyia Bezzi

Gnumyia Bezzi, 1921*a*: 82. Type species: *Gnumyia brevirostris* Bezzi, 1921, by original designation.

Comments: This is another genus rarely found in collections.

Key: Hesse (1938).

Distribution: Afrotropical: 2 species; *Gnumyia brevirostris* Bezzi (Western Cape, Namibia, Zimbabwe), *G. fascipennis* Hesse (Eastern and Western Cape).

Hyperusia Bezzi

Hyperusia Bezzi, 1921*a*: 84 [1924: 107]. Type species: *Hyperusia minor* Bezzi, 1921, by subsequent designation (Evenhuis, 1991: 45).

Comments: This genus is similar in appearance to *Corsomyza* but with a different distribution pattern. The species are found principally outside the winter-rainfall region of southern Africa, where *Corsomyza* spp. predominate, in tropical southern Africa, and with the addition of the new species described below, the distribution extends northwards to central Tanzania (map in Greathead 2000*a*).

Key: Hesse (1938).

Distribution: Afrotropical Region. South Africa, Namibia, Botswana: 8 species, and the following new species from Tanzania.

Hyperusia apiformis Greathead and Evenhuis **sp. n.**

Etymology: The specific name *apiformis* is Latin for bee-like.

Material examined: Holotype ♂. TANZANIA: 50–70 miles N Dodoma, 20.iv.1967 (D. J. Greathead) (BMNH). Paratypes. TANZANIA: 2♀, as holotype; 1♀, Kongwa, 20.iv.1967 (D. J. Greathead); 1♀, Dodoma, 3.iv.1966 (J.E.D.M[ilner]) on flowers.

Comments: This species is most similar to *H. transvaalensis* Hesse in having entirely black antennae, almost completely black body and predominantly pale whitish vestiture. It differs in having one strong median bristly hair at the apex of the last tarsal segment of the hind leg, fewer black hairs and bristles on the legs, and gleaming brassy scale-like hairs on the dorsal surface of the body of females.

Description: Holotype ♂. Length of body, 4 mm; of wing, 4 mm. Black, except extreme apices of femora, tibiae and basal four segments of tarsi which are yellow. Hair white, except for some black hairs on genae, second palpal segment, front coxae and femora. Bristles and spicules on legs pale yellow, except at apices of middle and hind tibiae and the long bristly hairs at apices of hind tarsi. *Head*: Cuticle shining. Eyes separated by width of ocellar triangle at vertex. Frons tumid above but depressed in middle at level of antennae. *Antenna*: Ratio 1.5:1:5, pedicel with strong dorsal spine at apex, flagellum narrow and apical third expanded club-like. Proboscis, projecting by 2 x length of antennae. Palpi about equal in length to flagellum and apical segment slightly broader than first. *Thorax and abdomen*: Hair long and silky and with sparse silvery scale-like hairs beneath on abdominal terga. *Legs*: Hind tarsi with a conspicuously long bristly hair at apex flanked by two shorter hairs. *Wing*: Milky hyaline. Veins pale yellow, r-m crossvein beyond middle of discal cell, cell cup open. Squama white, fringe white. Halter pale yellow with upper surface of knob white.

Paratype ♀ . Similar to holotype male but with a yellow-brown area on head at sides of antennae or more extensively brown on frons also; hair shorter and sparser and scale-like hairs dense brassy on dorsal surface of thorax and abdomen; frons 3 x width of ocellar triangle at vertex; wing tinged yellow and with yellow veins, cell cup open or closed on wing margin.

Mariobezzia Becker

Mariobezzia Becker, 1912: 422. *Nomen nudum*.
Mariobezzia Becker & Stein, 1912: 604. *Nomen nudum*.
Mariobezzia Becker, 1913: 470. Type species: *Mariobezzia lichtwardti* Becker, 1913, by monotypy [See Evenhuis (1991) for clarification of the type fixation for this genus.]

Comments: The type species, *Mariobezzia lichtwardti* Becker, is very variable in appearance (Efflatoun 1945) and three species described subsequently were synonymised with it.

Key: Egypt, Efflatoun (1945).

Distribution: Southern Palaearctic and Oriental (1 species, India and Pakistan) Regions, Sudan. North Africa: Egypt: 2 species; *M. lichtwardti* and *M. catherinae* Efflatoun. Africa South of the Sahara: Sudan: 1 species; *M. ebneri* Becker.

Megapalpus Macquart

Megapalpus Macquart, 1834: 394. Type species: *Phthiria capensis* Wiedemann, 1828, by monotypy.

Comments: Hesse (1938) gave characters for the separation of the two described, partially sympatric species, *M. capensis* (Eastern and Western Cape) and *M. nitidus* Macquart (Western Cape); however, specimens vary in the expression of these characters, and many show a combination of characters of the two putative species. Consequently, *M. nitidus* has been placed in synonymy with *M. capensis* and the genus is monotypic.

Megapalpus capensis has been studied as a pollinator of *Pelargonium tricolor* (Geraniaceae) (McDonald & van der Walt 1992) and *Gorteria diffusa* (Asteraceae) (Johnson & Midgley 1996).

Distribution: Monotypic. Afrotropical: Eastern and Western Cape: *Megapalpus capensis* (Wiedemann). Map (Greathead 2000*a*).

Pusilla Paramonov

Pusilla Paramonov, 1954: 27. Type species: *Pusilla longirostris* Paramonov, 1954, by original designation.

Comments: Only known from the unique holotype.

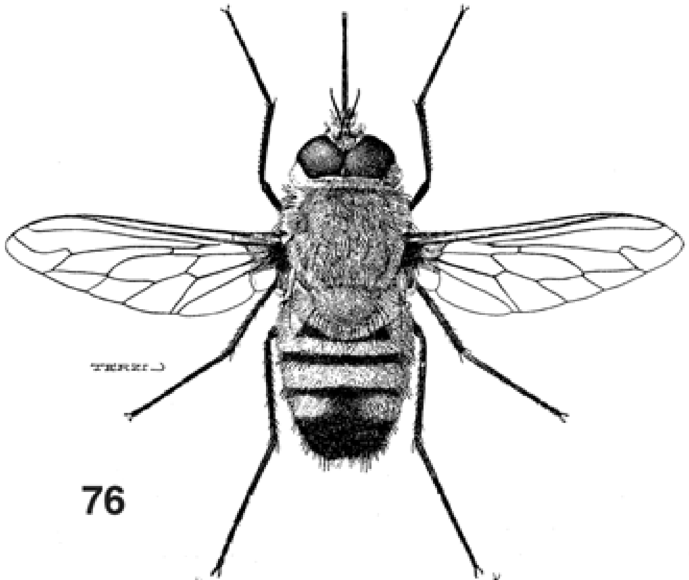
Distribution: Monotypic. Democratic Republic Of Congo: Kinshasa: *Pusilla longirostris* Paramonov.

Zyxmyia Bowden

Zyxmyia Bowden, 1960: 213. Type species: *Zyxmyia megachile* Bowden, 1960, by original designation.

Comments: Like other members of the Mariobezziinae, *Zyxmyia megachile* is variable in appearance.

Distribution: Monotypic. Kenya, Tanzania: *Zyxmyia megachile* Bowden. Map (Greathead 2000*a*).



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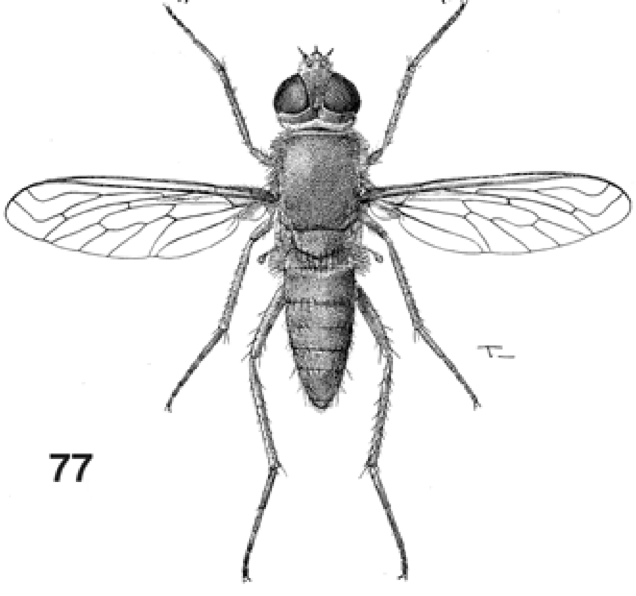

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Figs 76–77. Bombyliidae habitus drawings. 76. *Eurycarenus melanurus* Bezzi, male (from Bezzi 1924). 77. *Stomylomyia europaea* (Loew), female (from Austen 1937).

Oniromyiinae Greathead

Type genus: *Oniromyia* Bezzi, 1921.

This subfamily was proposed by Greathead (1972) to contain the anomalous South African genus *Oniromyia*, which had previously been place in the Cythereinae. Yeates (1994) substantiated this conclusion, and noted that the scape with ventral bulge, and scales on the labrum, constitute synapomorphies for the subfamily. However, *Oniromyia* has characters in common with *Xenoprosopa*, see below.

Oniromyia Bezzi

Oniromyia Bezzi, 1921*a*: 71. Type species: *Eurycarenus pachyceratus* Bigot, 1892, by original designation.
Xethomyza Hesse, 1938: 986, 989. Type species: *Eurycarenus pachyceratus* Bigot, 1892, by monotypy. [Unavailable; name proposed in synonymy with *Oniromyia* and not made available before 1961.]

Distribution: Afrotropical. South Africa: 2 species; *Oniromyia caffrariae* Hesse (Eastern Cape), *O. pachcerata* Bigot (Western Cape).

Xenoprosopinae Hesse

Type genus: *Xenoprosopa* Hesse, 1956.

Hesse (1956) proposed the Xenoprosopinae for a unique female specimen, which he described as *Xenoprosopa paradoxa*. He noted that it shares the bulge on the scape and weak development of the wings with *Oniromyia*, but differs in the vestigial mouthparts, structure of the head, and near absence of bristles. Yeates (1994), like other commentators, had not seen the unique specimen, but also commented on its similarity to *Oniromyia*. If the similarities are shown to be significant synapomorphies, then the Oniromyiinae must be synonymised with the Xenoprosopinae. The unique type specimen was seen by NLE when visiting the SAMC in 1990; he noted its condition, but did not examine it critically for taxonomic characters.

Xenoprosopa Hesse

Comments: Known only from the holotype female of *Xenoprosopa paradoxa* Hesse. Hesse noticed that in life *X. paradoxa* rests on sand and that it resembles a therevid or an asilid, with its whitish hair, elongate shape and conspicuously yellow-ringed abdomen and legs.

Distribution: Monotypic. South Africa: Western Cape: *Xenoprosopa paradoxa*.

Cythereinae Becker

Type genus: *Cytherea* Fabricius, 1794.

The Cylleniinae (the present tribes Cylleniini and Enicini) was long a repository for genera with a deeply concave occiput but without an indented posterior eye margin. Hall (1969) removed several genera which are now placed in the Ecliminae. Yeates (1994) demonstrated that it remained polyphyletic and transferred *Peringueyimyia* to the Lomatiinae. He also united the remaining African genera of Cylleniinae with the Cythereinae, but remarked that a re-examination of the tribal divisions would be in order.

Key to the tribes and genera of Cythereinae

1 Head with face very broad, antennae separated by more than length of scape; body with abundant hair and/or scales as well bristles .... **Cythereini**...2
– Head with face not exceptionally broad, antennae separated by less than length of scape; body with sparse hair and/or small scales, bristles strong and conspicuous 4
2 Cell r_5 closed and usually stalked; abdomen elongate conical .... **Callostoma** Macquart
– Cell r_5 open 3

3 Pulvilli rudimentary; vestiture predominantly grey to brown; wing infuscation often feint and with paler areas within the infuscated part; sexes similar in appearance .... **Cytherea** Fabricius

– Pulvilli normally developed; vestiture black with patches of white to yellow hair and scales; wing infuscation uniformly dark; male with an elongate, conical, hairy abdomen; female with a broad, scaly abdomen, and superficially tachinid-like .... **Chalcochiton** Loew

4 First flagellomere with numerous small bristles before the apex; metanotum clearly visible between scutellum and first abdominal tergum .... **Cylleniini**...5

– First flagellomere with, at most, one small macrochaeta on dorsal side; metanotum almost completely hidden by the scutellum which overhangs the first abdominal tergum .... **Enicini**...7

5 Proboscis not projecting beyond antennae; flagellum broad and not much longer than scape; wings with spots; abdomen short .... **Cyllenia** Latreille

– Proboscis projecting by at least length of head; flagellum lanceolate and as long as scape and pedicel together; wings sometimes with spots but mostly or completely hyaline; abdomen elongate 6

6 Face conically produced; proboscis 2–4 x as long as head; occiput not broader above than below ....**Amictus** Wiedemann

– Face gently rounded; proboscis about as long as head; occiput distinctly broader above .... **Sinaia** Becker

7 Cell r_1 divided by crossveins; frons with numerous strong bristles; face with abundant hair .... **Enica** Macquart

– Cell r_1 without crossveins; frons with some stiff hairs only; face with few if any hairs .... **Nomalonia** Rondani

Cythereini Becker

Callostoma Macquart

Callostoma Macquart, 1840: 77 [1841: 355]. Type species: *Callostoma fascipennis* Macquart, 1840, by original designation.

Callistoma Agassiz, 1846: 60 (unjustified emendation of *Callostoma* Macquart, 1840). Type species: *Callostoma fascipennis* Macquart, 1840, automatic.

Comments: The palaearctic species all have a distinctive pattern of black and white vestiture, and a brown transverse infuscated band across the middle of the wing. The single Afrotropical species, *Callostoma distinctum*, has a similar structure, except for minor differences in wing venation, but strikingly different pigmentation – yellowish vestiture and heavily infuscated wings, having a general resemblance to a species of *Rhagio* (Greathead 1972).

Hosts: Palaearctic species reared from egg-pods of Acridoidea (Greathead 1963; du Merle 1975).

Distribution: Middle East to Central Asia and India, Ethiopia. Not recorded from North Africa. Africa South of the Sahara: Ethiopia: Ogaden: 1 species; *Callostoma distinctum* Greathead.

Chalcochiton Loew

Chalcochiton Loew, 1844: 157. Type species: *Chalcochiton speciosus* Loew, 1844, by monotypy.

Logcocerius Rondani, 1863: 61 [1864: 61]. Type species: *Anthrax holosericea* Fabricius, 1794 (as '*M. holosericeus* Loew'), by original designation.

Loncocerius Bezzi *in* Becker, Bezzi, Bischof, Kertész & Stein, 1903: 182 (unjustified emendation of *Logcocerius* Rondani, 1863). Type species: *Anthrax holosericea* Fabricius, 1794, automatic.

Lonchocerius Bezzi, 1924: 4 (unjustified emendation of *Logcocerius* Rondani, 1863). Type species: *Anthrax holosericea* Fabricius, 1794, automatic.

Comments: This genus had been previously synonymised with *Cytherea*, but the species are strikingly different in appearance and appear to have different hosts. Consequently, it is now considered a valid genus.

Keys: Engel (1932–7), Paramonov (1931), and for Egypt, Efflatoun (1945), all as *Cytherea*.

Hosts: One record from nest of Eumeninae (du Merle 1975).

Distribution: Western Palaearctic Region. North Africa: 5 species; *Chalcochiton argentifrons* Macquart (Morocco, Algeria, Libya), *C. argyrocephalus* Macquart

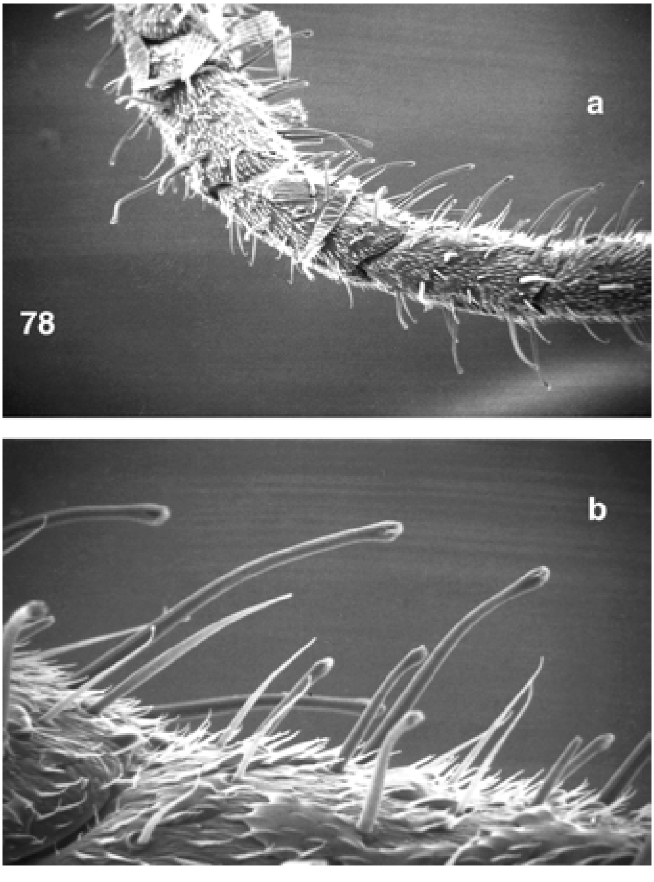


Fig. 78. *Exoprosopa* sp., scanning electron micrograph of female fore tarsi. *a*. fore tarsal segments showing setation. *b*. detail of modified hairs with clubbed apices.

(Morocco-Egypt), *C. bisalbifrons* (Bezzi) (Libya, Egypt), *C. holosericea* (Fabricius) (Morocco-Tunisia), *C. pallasii* (Loew) (Morocco).

Cytherea Fabricius

Cytherea Fabricius, 1794: 413. Type species: *Cytherea obscura Fabricius*, 1794, automatic [by designation of type species for *Mulio* by Latreille (1810: 443)].

Mulio Latreille, 1797: 155 (unnecessary new replacement name for *Cytherea* Fabricius, 1794). Type species: *Cytherea obscura Fabricius*, 1794, by subsequent designation (Latreille, 1810: 443).

Astropha Rafinesque, 1815: 130 (unnecessary new replacement name for *Cytherea* Fabricius, 1794). Type species: *Cytherea obscura Fabricius*, 1794, automatic.

Glossista Rondani, 1856: 163. Type species: *Mulio infuscatus* Meigen, 1820, by original designation.

Comments: With the recognition of *Chalcochiton* as a separate genus, this genus is readily recognised, and all reared species have the same host relations.

Keys: Engel (1932–7), Paramonov (1931), and for Egypt, Efflatoun (1945).

Hosts: Reared from egg-pods of Acridoidea (Greathead 1963; du Merle 1975).

Distribution: Western Palaearctic Region. North Africa: 13 species.

Cylleniini Becker

Type genus: Cyllenia Latreille, 1802.

Amictus Wiedemann

Amictus Wiedemann, 1817: 58. Type species *Bombylius oblongus* Fabricius, 1805, by monotypy.

Thlipsomyza Wiedemann, 1820: 12. Type species: *Bombylius compressus* Fabricius, 1805, by original designation (on plate).

Thlipsomyza Jensen, 1832: 327. Type species: *Bombylius compressus* Fabricius, 1805, by monotypy. [Preoccupied by Wiedemann, 1820.]

Thlipsogaster Rondani, 1863: 72 [1864: 72]. Type species: *Thlypsomyza castanea* Macquart, 1840, by subsequent designation (Bezzi, 1924: 4).

Truquia Rondani, 1863: 72 [1864: 72]. Type species: *Truquia insularis* Rondani, 1863, by original designation.

Comments: A genus of elongate flies that emit a high-pitched note when flying, like mosquitoes, which they resemble to some extent.

Keys: Engel (1932–7), Paramonov (1931), and Egypt, Efflatoun (1945).

Distribution: Palaearctic. North Africa: 14 species.

Cyllenia Latreille

Cyllenia Latreille, 1802: 429. Type species: *Cyllenia maculata* Latreille, 1802 [= *Asilus rusticus* Rossi, 1790], by monotypy.

Key: Engel (1932–7), Paramonov (1929).

Hosts: One record of a rearing from a cocoon of a tenthredinid (du Merle 1975).

Distribution: Palaearctic. North Africa: Tunisia: 1 species; *Cyllenia laevis* Bigot.

Sinaia Becker

Sinaia Hermann, 1909: 149. Type species: *Sinaia kneuckeri* Becker, 1916, by subsequent designation (Evenhuis, 1991: 69). *Nomen nudum*.

Sinaia Becker, 1916: 65. Type species: *Sinaia kneuckeri* Becker, 1916, by original designation.

Distribution: Monotypic. Egypt: *Sinaia kneuckeri* Becker.

Enicini Hall

Type genus: *Enica* Macquart, 1834.

Enica Macquart

Enica Macquart, 1834: 399. Type species: *Anthrax longirostris* Wiedemann, 1819, by monotypy.

Henica Agassiz, 1846: 138, 178 (unjustified emendation of *Enica* Macquart, 1834). Type species: *Anthrax longirostris* Wiedemann, 1819, automatic.

Lagochilus Loew, 1860*a*: 87 [1860*b*: 273; 1860*c*: 201]. Type species: *Cyllenia afra* Wiedemann, 1828 [= *Anthrax longirostris* Wiedemann, 1819], by monotypy.

Alonipola Rondani, 1863: 71 [1864: 71]. Type species: *Cyllenia pluricellata* Macquart, 1855 [= *Anthrax longirostris* Wiedemann, 1819], by original designation.

Comments: *Enica longirostris* is extremely variable in size and resembles *Cyllenia* spp. in habitus.

Distribution: Monotypic. South Africa: Western Cape: *Enica longirostris* (Wiedemann).

Nomalonia Rondani

Nomalonia Rondani, 1863: 71 [1864: 71]. Type species: *Cyllenia afra* Wiedemann, 1828, [misidentification, = *Nomalonia eremophila* Hesse, 1975], by original designation.

Key: Hesse (1956).

Distribution: Afrotropical: Western Cape: 6 species.

Lomatiinae Schiner

Type genus: *Lomatia* Meigen, 1820.

The scope of the Lomatiinae has been reduced since Hesse's (1956) study, by the removal of his *Aphoebantus*- and *Petrorossia*-groups into the Anthracinae and Antoniinae (Bowden 1980). Yeates' (1994) study showed that this was justified, and that *Peringueyimyia*, formerly placed in the Cylleniinae, should be transferred to the Lomatiinae as a separate tribe.

Key to genera of Lomatiinae

1 Hind margin of eye entire; mesonotum with numerous strong bristles at sides; aedeagus expanded at apex; spermathecal bulb elongate .... [**Peringueyimyiini**] **Peringueyimyia** Bigot

– Hind margin of eye indented; mesonotum with few bristles at sides, often inconspicuous in front of wing; aedeagus pointed; spermathecal bulb short .... **Lomatiini**...2

2 Abdominal terga with free margins yellow; no adpressed scale-like hairs on abdomen; abdominal cuticle smooth, shining; spermathecal bulb spheroidal 3

– Abdominal terga entirely black; adpressed scale-like hairs present on abdomen; abdominal cuticle dull, tomentose; spermathecal bulb pear-shaped 4

3 Antenna with scape brown, flagellum elongate conical; metepimeron bare; legs brown; wing with cell r_5 closed and vein R_4 with an appendix (Fig. 83); bristles on legs weak, absent from mid femur; body extensively orange-yellow, wasp-like in appearance .... **Anisotamia** Macquart

– Antenna with scape black, flagellum broad at base and with a long thin apical section; metepimeron with hairs; legs black; wing with cell r_5 open and vein R_4 without an appendix; bristles on legs strong, present on underside of mid femur; body largely black, not wasp-like in appearance .... **Lomatia** Meigen

4 Wing very much longer than body, entirely infuscated, vein R_4 often with an appendix or with an angular bend, vein m-m at an angle to wing margin so that discal cell appears truncated .... **Canariellum** Strand

– Wing only a little longer than body, not entirely infuscated, and with at least the apex hyaline; vein R_4 without an appendix and with a rounded bend, vein m-m frequently almost parallel to wing margin so that discal cell appears pointed .... **Notolomatia** Greathead

Lomatiini Schiner

The palaearctic and afrotropical Lomatiini were reviewed by Greathead (1998), and characters were given for the recognition of the afrotropical species of *Lomatia* as a separate genus.

Anisotamia Macquart

Anisotamia Macquart, 1840: 81 [1841: 359]. Type species: *Anisotamia ruficornis* Macquart, 1840, by subsequent designation (Coquillett, 1910: 507).

Comments: Large, elongate, yellow-and-black flies bearing some resemblance to male scoliids.

Distribution: North Africa to Pakistan. North Africa: Egypt and possibly Algeria: 1 species; *Anisotamia ruficornis* Macquart (Greathead 1998).

Canariellum Strand

Canaria Becker, 1912: 422. *Nomen nudum.*

Canaria Becker, 1913: 462. Type species: *Anthrax brunnipennis* Macquart, 1839, by original designation. [Preoccupied by Partington, 1835.]

Canariellum Strand, 1928: 48 (new replacement name for *Canaria* Becker, 1913). Type species: *Anthrax brunnipennis* Macquart, 1839, automatic.

Comments: This genus was erected for *Anthrax brunnipennis* Macquart, an endemic species from the Canary Islands, but the genus was long regarded as a synonym of *Lomatia* by authors who had not seen specimens. However, François (1970) collected a long series of *C. brunnipennis*, and redescribed and recognised *Canariellum* as a valid genus. Bowden (1975*b*) showed that two African species described in *Lomatia* should also be included.

Keys: Included in keys to *Lomatia* spp. Palaearctic, Engel (1932–7); Afrotropical, Bezzi (1924).

Distribution: Africa and Canary Islands. Palaearctic: Canary Islands: 1 species *Canariellum brunnipenne* (Macquart). Africa South of the Sahara: 2 species; *C. acutangula* (Bezzi) (Eastern South Africa), *C. neavei* (Bezzi) (Malawi, possibly also Uganda (Greathead 1998)).

Lomatia Meigen

Stygia Meigen, 1820: 137. Type species: *Anthrax belzebul* Fabricius, 1794, by subsequent designation (Westwood, 1840: 131) [Type designation for *Lomatia* Meigen, 1822, with *Stygia* in synonymy]. [Preoccupied by Latreille, 1804.]

Lomatia Meigen, 1822: [Vorrede] (unpaginated) [1830: 324] (new replacement name for *Stygia* Meigen, 1820). Type species: *Anthrax belzebul* Fabricius, 1794, by subsequent designation (Westwood, 1840: 131).

Stygide Latreille, 1825: 491 (new replacement name for *Stygia* Meigen, 1820). [Unavailable; vernacular name without status in nomenclature.]

Stygidium Berthold, 1827: 500 (new replacement name for *Stygia* Meigen, 1820). Type species: *Anthrax belzebul* Fabricius, 1794, automatic.

Stygides Latreille, 1829: 465 (new replacement name for *Stygia* Meigen, 1820). Type species: *Anthrax belzebul* Fabricius, 1794, automatic.

Nettadion Gistel, 1848: ix (unjustified new replacement name for *Lomatia* Meigen, 1822). Type species: *Anthrax belzebul* Fabricius, 1794, automatic.

Ancentralis Bezzi, 1925: 199. Type species: *Anthrax pictipennis* Wiedemann, 1828, by monotypy. [Unavailable; name proposed in specific synonymy with *pictipennis* Wiedemann and not made available before 1961. See Evenhuis (1991: 18) for details.]

Comments: Hesse (1956) recognised that the African species of *Lomatia* differ in appearance from the palaearctic species and probably constituted a separate genus, but hesitated to describe a new genus because of his uncertainties over the status of the genus *Canariellum*. Greathead (1998) showed that the afrotropical species of *Lomatia sensu lato* differ from palaearctic species in the male and female genitalia, as well as in their vestiture and colour patterns, and proposed a separate genus to contain the African species. Thus, *Lomatia* is now restricted to palaearctic species.

Keys: Engel (1932–7), Paramonov (1931).

Hosts: One record as ectoparasitoid on larvae of Tenebrionidae (du Merle 1975).

Distribution: Palaearctic. North Africa: 6 species (Morocco to Libya, but surprisingly not Egypt).

Notolomatia Greathead

Notolomatia Greathead, 1998: 219. Type species: *Lomatia inornata* Loew, 1854, by original designation

Comments: As explained above, *Notolomatia* was proposed for afrotropical species formerly included in *Lomatia*.

Keys: Afrotropical, Bezzi (1924); southern Africa, Hesse (1956).

Distribution: Afrotropical. Africa South of the Sahara: 100 species (mostly southern Africa also south-western Arabia).

Peringueyimyiini Hull

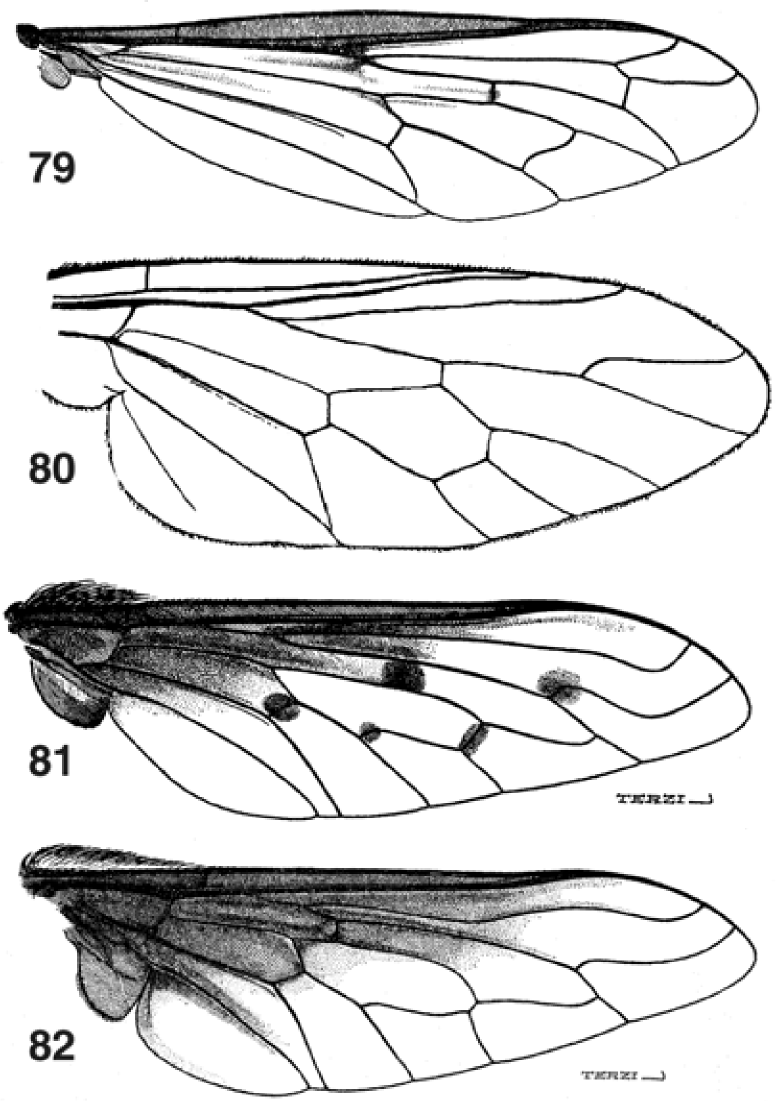
Type genus: *Peringueyimyia* Bigot, 1886.

Peringueyimyia Bigot

Peringueyimyia Bigot, 1886*b*: cx [1886*d*: cx]. Type species: *Peringueyimyia capensis* Bigot, 1886, by monotypy.

Comments: This genus was formerly placed as a monotypic tribe in the Cylleniinae, but Yeates (1994) showed that it has the characters of the Lomatiinae, except that the eyes are entire, and so constitutes a monotypic tribe within the Lomatiinae.

Distribution: Monotypic. South Africa: Northern and Western Cape: *Peringueyimyia capensis* Bigot.



Figs 79–82. Bombyliidae wings. 79. *Systropus leptogaster* Loew (from Bezzi 1924). 80. *Heterotropus* sp. (Namibia) (original) 81. *Australoechus punctifer* (Bezzi). 82. *Systoechus robustus* Bezzi (all from Bezzi 1924).

Antoniinae Hull

Type genus: *Antonia* Loew, 1856.

Hull (1973) placed *Antonia* in a new tribe, Antoniini of the Lomatiinae, and Bowden (1980) raised the tribe to a subfamily. Yeates (1994) showed that this was a correct conclusion. Other small genera included in the Antoniinae occur in Australasia.

Antonia Loew

Antonia Loew, 1856: 30. Type species: *Antonia suavissima* Loew, 1856, by monotypy.
Dimorphaphus Walker, 1871*a*: 255. *Nomen nudum.*
Dimorphophora Walker, 1871*b*: 272. Type species: *Dimorphophora syrphoides* Walker, 1871 [= *Antonia suavissima* Loew, 1856], by monotypy.

Comments: *Antonia* spp. are elongate flies with a striking pattern of yellow and black cuticle. The sand chamber has been lost, and there is only a single spermatheca.

Keys: Palaearctic, Engel (1932–7), Paramonov (1931); Afrotropical, Bezzi (1924); southern Africa, Hesse (1956).

Hosts: Species of *Antonia* have been reared from the nests of a *Bembix* sp. and a mud-daubing wasp (du Merle 1975).

Distribution: Palaearctic and Afrotropical Regions. North Africa: 2 species; *Antonia bouillonae* Séguy (Morocco, Tunisia), *A. suavissima* Loew (Algeria, Egypt). Africa South of the Sahara: 7 species.

Tomomyzinae Becker

Type genus: *Tomomyza* Wiedemann, 1820.

The subfamily Tomomyzinae originally included *Antonia* and the genera now placed in the Prorostomatini. This arrangement was accepted by Hesse (1956), but most other authors had synonymised the Tomomyzinae with the Cylleniinae. However, Yeates (1994) found that the African genera *Tomomyza* and *Pantostomus*, along with four other genera from the Americas and Australia, form a separate clade and constitute a valid subfamily.

Key to genera of Tomomyzinae

1 Body and legs predominantly reddish-brown; abdomen cylindrical, humped in appearance; terga 2–5 usually with a depression at each side .... **Pantostomus**
– BezziBody and legs predominantly black; abdomen laterally compressed or flattened, not humped; terga with at most with very small, shallow depressions at each side .... **Tomomyza** Wiedemann

Pantostomus Bezzi

Pantostomus Bezzi, 1921*b*: 474 [1922*a*: 79]. Type species: *Pantostomus gibbiventris* Bezzi, 1921, by monotypy.

Key: Hesse (1956).

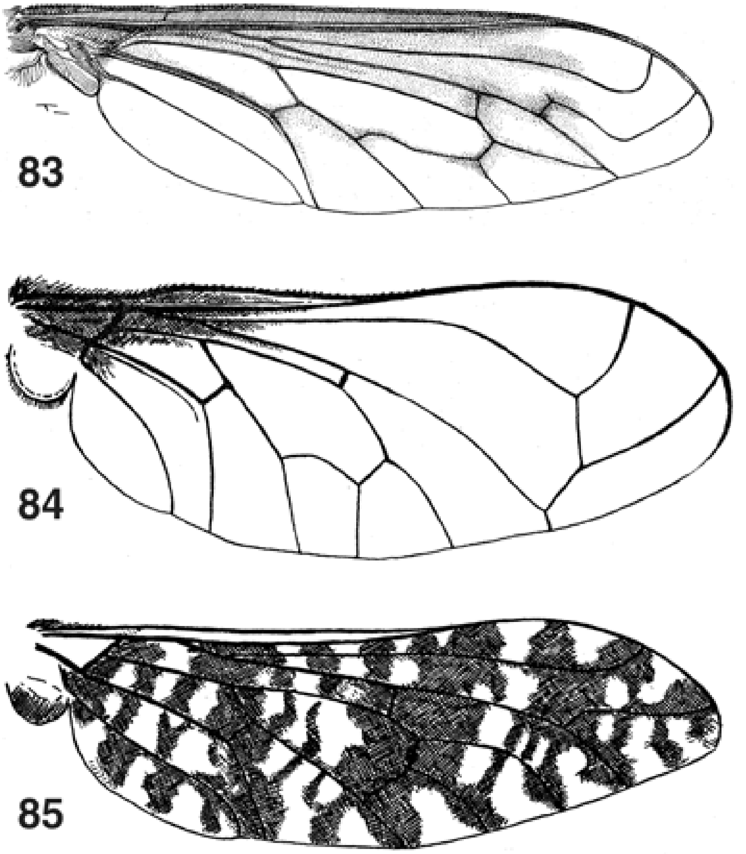
Distribution: South Africa to Zimbabwe: 9 species.

Tomomyza Wiedemann

Tomomyza Wiedemann, 1820: 9. Type species: *Tomomyza anthracoides* Wiedemann, 1820, by original designation (on plate).
Tomomyza Jensen, 1832: 324. Type species: *Tomomyza anthracoides* Jensen, 1832 [preoccupied, = *Tomomyza anthracoides* Wiedemann, 1820], by monotypy. [Preoccupied by Wiedemann, 1820.]

Key: Hesse (1956).

Distribution: South Africa to Tanzania: 11 species.



Figs 83–85. Bombyliidae wings. 83. *Anisotamia ruficornis* Macquart (from Austen 1937). 84. *Othniomyia tylopelta* Hesse. 85. *Prorachthes conspersipennis* Hesse (all from Hesse 1938).

Anthracinae Latreille

The Anthracinae are the largest subfamily of the Bombyliidae in terms of numbers of species. The tribal classification in present use follows Yeates (1994). However, he did not study many genera, and the limits of his tribes require re-evaluation since not all of the synapomorphies used to define them are present in all of the genera that have been allocated to them. The Anthracini, Exoprosopini and Villini are, for the most part, easily differentiated and allocated to the correct tribe, but the limits of the Aphoebantini, Prorostomatini and Xeramoebini in particular are not well defined. Likewise, some of the genera are poorly supported by synapomorphies.

Key to tribes and genera of Anthracinae

1 R_{2+3} originating at an acute angle close to origin of Rs (Fig. 87); face not produced or with oral rim slightly projecting; abdomen conical or elongate ovate; palpi with two segments; male holoptic .... **Aphoebantini**...2

– R_{2+3} originating at right angles between the origin of Rs and the r-m crossvein (Figs 88–99), exceptionally (some Prorostomatini) arising at an acute angle close to origin of Rs but then face is produced; face projecting or smoothly rounded; abdomen conical, elongate ovate or broad and flattened; palpi with one segment; male dichoptic 5

2 Interradial crossvein complete (3 submarginal cells) 3
– Interradial crossvein incomplete (2 submarginal cells) 4

3 Cell r_5 closed and stalked; face with hair evenly distributed; frons with erect bristly hair .... **Pteraulax** Bezzi
– Cell r_5 open; face with a brush of bristly hair at apex; frons with dense scales and fine hair (Fig. 54) .... **Pteraulacodes** Hesse

4 Antenna with two flagellomeres: gonocoxae evenly tapered from a broad base; aedeagus conical .... **Aphoebantus** Loew
– Antenna with three flagellomeres: gonocoxae broad in basal half, abruptly narrowed in middle and narrow in apical half; aedeagus elongate and narrow .... **Cononedys** Hermann

5 R_{2+3} usually originating closer to the origin of Rs than to the r-m crossvein; facial cone strongly developed and distinctly separated from frons (Fig. 55); hind margin of eye usually without a bisecting line; body narrow, elongate (Fig. 77) .... **Prorostomatini**...6
– R_{2+3} originating closer to r-m crossvein than to Rs or opposite it; face projecting to a variable extent but not distinctly separated from frons or smoothly rounded; hind margin of eye usually with a bisecting line; body narrow, elongate, or broad, abdomen flattened 11

6 Interradial crossvein absent (2 submarginal cells) 7
– Interradial crossvein present (3 submarginal cells) (Fig. 77) ... **Stomylomyia** Bigot

7 Wing with alula reduced or vestigial and axillary lobe narrow; eye indentation very shallow 8
– Wing with alula and axillary lobe broad; eye indentation shallow or deep and angular 10

8 Wing usually hyaline; R_{2+3} without an appendix near its base; fore and mid femora without strong bristles; front claws usually markedly reduced 9
– Wings with a distinct basicostal infusion; R_{2+3} sharply bent near its base and emitting an appendix; all femora with strong bristles; front claws at most only slightly smaller than middle ones .... **Coryprosopa** Hesse

9 Occiput long behind ocellar triangle, central groove deep and narrower than ocellar triangle (Fig. 57); fore tarsi at least as long as fore tibiae, without distinct spinules below; claws markedly reduced or vestigial; phallosome short and with a large epiphallus .... **Plesiocera** Macquart
– Occiput short behind ocellar triangle, central groove as broad as ocellar triangle (Fig. 58); fore tarsi shorter than fore tibiae, with distinct spinules below; front claws scarcely smaller than middle ones; phallosome long and slender, without a prominent epiphallus .... **Conomyza** Hesse

10 Hind margin of eyes only slightly emarginate; hind margin of scutellum rounded, not shining .... **Prorostoma** Hesse

– Hind margin of eyes distinctly emarginate; hind margin of scutellum emarginate or bilobed, shining .... **Epacmoides** Hesse

11 R_{2+3} usually originating before the r-m crossvein; face rounded, not produced; femora without strong bristles below; body narrow, elongate to moderately broad .... **Xeramoebini**...12

– R_{2+3} originating opposite the r-m crossvein or very close to it (if exceptionally, R_{2+3} originates before r-m crossvein face is prominent); body broad, at least hind femora usually with a row of strong bristles below; abdomen usually broad, flattened ... 16

12 Wing relatively broad, alula large and lobe-like; discal cell short, origin of R_{2+3} opposite r-m crossvein or less than twice its length from r-m crossvein 13

– Wing relatively narrow, alula reduced and narrow; discal cell long, origin of R_{2+3} basal to r-m crossvein by at least twice its length, often three times its length (Fig. 88) 15

13 Frons broad at level of antennae, tumid, with silvery tomentum and fine hairs (Fig. 56); body narrow, abdomen conical; gonostyli elongate, rod-like; phallosome large, conical without an epiphallus (Fig. 109) .... **Desmatoneura** Williston

– Frons not unusually broad; body with small scales and coarse hairs; gonostyli broad at base and with a curved pointed apical part; phallosome with a large dorsal epiphallus (Fig. 110) 14

14 Fore tibiae spiculate; wing often with an infuscation along margins of veins towards base; laterotergite bare; cuticle brown to black with white, brown to black dull scales .... **Xeramoeba** Hesse

– Fore tibiae smooth; wing iridescent, hyaline; laterotergite with a tuft of hair; cuticle black with white and glossy black scales .... **Prothaplocnemis** Bezzi

15 Crossvein r-m before middle of discal cell (Fig. 88); body elongate, abdomen flattened, with hairs and sparse small scales; phallosome with epiphallus about equal in length to aedeagus and without spines on dorsal surface .... **Petrorossia** Bezzi

– Crossvein r-m near middle of discal cell; body short, cylindrical; abdomen with scales and without hairs; epiphallus much longer than aedeagus, with spines on dorsal surface .... **Pipunculopsis** Bezzi

16 Antennae with scape and pedicel quadrate and of similar width, flagellum elongate; veins in Rs usually without recurrent appendices, mediotergite and laterotergite with hair; abdomen usually covered with adpressed scales of various colours, hairs fine, sparse 21

– Antennae remarkably compacted, flagellum terminating in a circlet of hairs (Figs 67–68), often onion-shaped, narrow part usually with a distinct suture; veins in Rs often with recurrent appendices (Figs 89–90); mediotergite and laterotergite bare; body usually broad with an ovate abdomen; usually with coarse hair and scales not adpressed, usually mostly black, white or silvery and dull ochreous to brown .... **Anthracini**...17

17 Wing with cell r_4 divided into two by a crossvein, cell r_5 closed and stalked (Fig. 89); vestiture on thorax and abdomen composed of hair only ... **Dicranoclista** Bezzi

– Wing with cell r_4 not divided by a crossvein, cell r_5 open or occasionally closed on wing margin; vestiture on thorax and abdomen composed of scales and hair ... 18

18 Pedicel flattened, closely applied to scape and flagellum, may be hollowed to receive flagellum (Fig. 68); wing without an extensive black basicostal infuscation, clear or spotted, sometimes with a diffuse brownish infuscation at base and along fore border; body without predominantly black dense scales lying flat on abdomen 19

– Pedicel globular or disc-shaped, not moulded to flagellum (Fig. 67); wings usually with a more or less extensive infuscation, seldom almost completely hyaline; body with dense scales, lying flat, predominantly black with patches of white or silver scales on abdomen 20

19 Body with shaggy, upstanding, cuneiform scales, frequently with prominent tufts of contrasting colours at sides of abdomen; scales black, brown and white, giving an overall dusty-grey effect; usually with at least some black hairs and bristles on thorax and abdomen .... **Spogostylum** Macquart

– Body with sparse scales, only conspicuous as spots of metallic scales on some abdominal terga, and with bright yellow to orange hair, dense at sides of abdomen; without black hair or bristles on thorax and abdomen ... **Turkmeniella** Paramonov

20 Flagellum conical; wing completely infuscated, yellow or greyish; large, over 15 mm .... **Satyramoeba** Sack

– Flagellum onion-shaped (Fig. 67); wings usually with a more or less extensive brown or black infuscation, seldom almost completely hyaline (Fig. 90), never completely infuscated; small to large species, up to 15 mm ..... **Anthrax** Schrank

21 Wing usually with interradial crossvein between R_{2+3} and R_4 absent (2 submarginal cells) (Figs 91–93); claws without a tooth at base; pulvilli sometimes present ...... **Villini**...22

– Wing with interradial crossvein between R_{2+3} and R_4 present (3 submarginal cells) (Figs 94–96, 98–99), sometimes also cell r_4 divided into two by a crossvein (4 submarginal cells) (Fig. 97); claws with a tooth (= conical pulvillus) at base .... **Exoprosopini**...33

22 Mouthparts reduced, not functional 23

– Mouthparts normally developed 25

23 Head much narrower than thorax; cell cup narrowly open at wing margin; wing with a basicostal infuscation .... **Oestranthrax** Bezzi

– Head almost as broad as thorax; cell cup closed before wing margin 24

24 Mouthparts reduced but palpi present; wing hyaline .... **Marleyimyia** Hesse

– Mouthparts very reduced, concealed in a slit, palpi absent; wing with an infuscated area at middle .... **Villoestrus** Paramonov

25 Antenna usually with flagellum onion-shaped (Fig. 69), composed of a single flagellomere; face rounded, at most only slightly bulging (Fig. 51) 26

– Antenna with flagellum conical (Figs 70–73), frequently with two flagellomeres; face frequently strongly produced, conical, never completely undeveloped...... 27

26 Fore tibiae with short bristles, spiculate; pulvilli absent; wing with at most a narrow basicostal infuscation, male often with a patch of silvery scales at its base; usually with extensive yellowish hair, especially on thorax; abdomen with a more or less distinctly banded pattern and one or more pairs of tufts of black scales at sides ....**Villa** Lioy

– Fore tibiae smooth or with a few weak bristles; pulvilli sometimes present; wing with an extensive dark pattern reaching the hind margin at base and covering at least half its surface (Fig. 92), no silvery scales at base; body with extensive black hair; abdomen with at most two white scale bands, remainder black and without contrasting tufts of black scales at sides .... **Hemipenthes** Loew

27 Pulvilli present; vestiture uniform whitish or yellowish 28

– Pulvilli absent; vestiture usually including bands of scales of various colours, rarely entirely white or yellow 29

28 Hind margin of eye without a bisecting line; all tibiae spiculate; flagellum with a short second flagellomere; wing with a diffuse basicostal infuscation; cell cup open; vestiture composed chiefly of yellowish hair, bee-like .... **Synthesia** Bezzi

– Hind margin of eye with a bisecting line; fore tibiae smooth, others with only a few weak bristles; flagellum elongate conical without a distinct second flagellomere; wing hyaline; cell cup closed at wing margin; hair weakly developed, except at sides of abdomen; vestiture composed predominantly of white (male) or yellowish (female) scales .... **Laminanthrax** Greathead

29 Flagellum elongate conical with a terminal bristle-like style; face weakly developed; cell r_5 narrowed at wing margin, contact of cell cua1 (fourth posterior) with discal cell much shorter than basal vein of former; often with an extensive wing pattern; apex of epiphallus curled dorsally at apex (Fig. 117) 30

– Flagellum elongate conical with a distinct second segment, or flagellum blade shaped (Figs 70–72); face often markedly produced (Fig. 52); cell r_5 narrowed or not; contact of cua1 (fourth posterior) with discal cell often long; wing pattern usually reduced, if extensive, it is fully developed in one sex only; apex of epiphallus flat (Fig. 115) 31

30 Wing with anal area very broad; r-m crossvein beyond middle of discal cell, its terminal vein oblique to wing margin; wing pattern dimidiate, uniform, dark; metallic scales present on body; vestiture mainly black; abdomen with a fringe of hairs at sides .... **Caecanthrax** Greathead

– Wing normally developed; r-m crossvein at middle of discal cell, its terminal vein more or less parallel with wing margin; wing infuscation paler at base and with hyaline spots on crossveins (window panes) (Fig. 91); vestiture composed of black, brown, yellow and white elements; face with pale scaling; a distinct pale notopleural stripe; abdomen banded and with dense hair at sides of basal segments only (Fig. 100) .... **Thyridanthrax** Osten Sacken

31 Face rounded with abundant hair (Fig. 52); antenna with two flagellomeres (Fig.71); fore claws greatly reduced, inner one sometimes smaller than outer one; wing with a pale infuscation at base and in costal cell, and with, or without, a dark infuscation in middle, pattern equally developed in both sexes; cell r_5 narrowed at wing margin; contact of cell cua1 (fourth posterior) with discal cell shorter than basal vein of former; abdomen cordate or elongate ovate with hair at sides and on dorsal surface sparse, not forming distinct rows across terga; gonocoxa with a crest bearing stiff spine-like hairs (Fig. 116) .... **Pachyanthrax** François

– Face angularly produced (Fig. 53) with few if any hairs but with dense scales; antenna with one or two flagellomeres (Figs 72–73); fore claws large equally well developed; wing with various degrees of infuscation, often sexually dimorphic; cell r_5 hardly narrowed at wing margin; contact of cell cua1 (fourth posterior) with discal cell longer than basal vein of former; abdomen elongate ovate or parallel-sided with dense hair at sides of first terga only and with bristly hair in rows at hind margins of terga; gonocoxa with or without a crest but if crested scarcely raised and with normal hairs (Fig. 115) 32

32 Face strongly developed, conical, often forming an acute angle when viewed in profile (Fig. 53); flagellum elongate conical with a well developed second flagellomere (Fig. 72); head usually with at least some metallic scales, often with dense patches above antennae; wing usually with a more or less well developed dark basicostal infuscation, tending to be more extensively developed in females, rarely almost completely hyaline; gonocoxa sometimes with a crest, epiphallus usually with a pair of dorsal spines (Fig. 115) .... **Exhyalanthrax** Becker

– Face less strongly developed, blunt in profile; flagellum blade-shaped, lacking an obvious second flagellomere (Fig. 73); head with few hairs and without metallic scales but yellow or white scales present on face; wing pattern, if present, variable but more extensive in males and ending almost perpendicular to fore margin; gonocoxa always without a crest, epiphallus often spinulate ... **Veribubo** Evenhuis

33 Wing with interradial crossvein present between R_{2+3} and R_4, but r_4 not divided into two by a crossvein (3 submarginal cells) (Figs 94–96) 34

– Wing with interradial crossvein between R_{2+3} and R_4 and cell r_4 divided into two by a crossvein (4 submarginal cells) (Fig. 97) .... **Ligyra** Newman

34 Face rounded; proboscis projecting by as much as length of head; wing with a characteristic brown basicostal infuscation continued as a median band across the wing at the apex of the discal cell, usually reaching the posterior margin (Fig. 94); body often extensively brown or orange with brown to orange vestiture ....
Litorhina Bowden

– Face projecting (but only slightly in *Atrichochira*); proboscis rarely projecting by as much as the length of head; wing pattern and colouring usually otherwise but, if with a *Litorhina* wing pattern, proboscis not projecting and/or first flagellomere much longer than second 35

35 Body and legs with bristles weak and reduced in number; epiphallus much widened at apex and pointed at each side and gonostyli, simple, U-shaped (Fig. 120); spermatheca narrow thin-walled elongate, not pigmented 36

– Bristles normally developed; epiphallus not markedly widened at apex and without points at each side and gonostyli of a different shape (Figs 118, 123); spermatheca thick-walled, usually pigmented and usually with a rounded terminal bulb 37

36 Cuticle, especially frons, shining and with iridescent or metallic scales ....
Micomitra Bowden

– Cuticle tomentose, not shining; without any iridescent or metallic scales on head or thorax .... **Atrichochira** Hesse

37 Wing usually with normal venation, rarely with appendices or subdivision of cells; cell r_5 open at wing margin (except *E. enigma* sp. n. (Fig. 99) but other characters do not differ); wing pattern various, but rarely with veins bordered with infuscation,

and of a different colour to infuscation in centres of cells, usually without isolated spots on crossveins (Figs 96, 99); hair and scales of various colours, frequently with stripes or uniform colouring; male genitalia large, epiphallus not chisel or axe-shaped, apodemes large (Fig. 119); spermathecae of various shapes but not narrow, tubular and thick-walled 46

– Wing tending to have unstable venation, frequently with appendices and divided cells; cell r_5 sometimes closed; wing pattern often with veins bordered with a different colour to centres of cells, frequently with isolated spots (Figs 95, 98); hair and scales black, brown and yellow to white, often mixed or arranged in ill-defined bands; male genitalia small, epiphallus chisel or axe-shaped, apodemes weak and usually not projecting outside enclosing gonocoxae (Figs 118, 123); spermathecae narrow, tubular and thick-walled .... **Heteralonia** Rondani…39

39 Cell r_{2+3} divided by a crossvein; wing pattern comprising eye-like spots on crossveins .... **Heteralonia** (**Heteralonia**) Rondani

– Cell r_{2+3} not divided by a crossvein; spots on wings, if present, not eye-like 40

40 Cell r_5 divided by a crossvein or closed and with a long stalk; vestiture usually composed predominantly of pale, sandy-coloured hair and scales; wing-pattern diffuse, usually pale and with paler borders to veins or small, darker spots on crossveins, often paler at base and with a darker diagonal middle band before a hyaline apical band; if wing vein characters not present, then vestiture and wing pattern are as described .... **Heteralonia** (**Zygodipla**) Bezzi

– Cell r_5 not divided by a crossvein, open or if closed then with at most a very short stalk; vestiture usually brown to blackish; wing pattern various but not as above 41

41 Discal cell broad and angular at apex, emitting an appendix into cell m_2 (third posterior) (Fig. 95) 42

– Discal cell, if broad at apex, not angular and not emitting an appendix into cell m_2 44

42 Cell m_2 divided into two by appendix (5 posterior cells) ....
Heteralonia (**Metapenta**) Bezzi

– Cell m_2 not divided into two (4 or 5 posterior cells) 43

43 Cell m_1 divided into two by a crossvein (5 submarginal cells); wing almost completely infuscated; body narrow, parallel sided ... **Heteralonia** (**Mesoclis**) Bezzi

– Cell m_1 not divided into two by a crossvein (4 submarginal cells); wing usually not almost completely infuscated and with pigment concentrated as spots or along borders of veins; body broad rounded .... **Heteralonia** (**Acrodisca**) Bezzi

44 Cross-vein m-m long, sinuous and parallel to hind margin of wing so that discal cell is long and tapered at apex; wing-pattern uniform in density, extensive but often with a clear spot or indention over the middle of the discal cell; scaling on abdomen uniform in colour or with a bold division into areas of different colour .... **Heteralonia** (**Homalonia**) Bowden

– Cross-vein m-m short and straight or slightly sinuous and at an angle with hind margin of wing so that discal cell tends to appear truncated at apex; wing pattern tending to be darker and denser along fore margin and to be composed of spots or infuscated borders to veins which may reach hind margin; scaling on abdomen composed of scales of different colours, not differentiated into distinct areas or with a tendency to form a paler band across the base of tergum 2 45

45 Proboscis not or barely projecting; anal area and alula not reduced so that wing is normally broad at base (Fig. 95); wing with anterior infuscation merging into the spots or dark borders on veins in the hind part; abdomen without the appearance of a fringe of dense scales at sides .... **Heteralonia** (**Acrodisca**) Bezzi

– Proboscis usually projecting, sometimes by more than the length of the head; anal area narrow and alula reduced so that wing appears petiolate (Fig. 98); wing with anterior infuscation sharply marked off from hind part which is tinged brownish; abdomen tending to have a fringe of dense scales at sides .... **Heteralonia** (**Isotamia**) Bezzi

46 Eyes with distinct hairs; body narrow; wings pedunculate, longer than body, with an extensive infuscation forming a characteristic pattern and margined with short fine hairs .... **Diatropomma** Bowden

– Eyes without distinct hairs; body usually broad; wings usually not pedunculate, variously infuscated or practically hyaline, not margined with short hairs 47

47 Hind tibiae with a fringe of large scales, giving a feathered appearance; predominantly black and with chiefly black vestiture; wing infuscated black, except at extreme apex .... **Pterobates** Bezzi

– Hind tibiae with small scales lying flat; body and vestiture of various colours; wing with a variety of patterns or almost completely hyaline (Fig. 96) ...... **Exoprosopa** Macquart

Anthracini Latreille

The tribe Anthracini is readily recognised by the structure of the antenna. Yeates (1994) emphasises the presence of a circlet of hairs at the apex of the antenna as diagnostic, but this is absent in the neotropical genus *Walkeromyia* Paramonov and present in some species of *Xeramoeba*. Most of the genera are difficult to determine on external characters, but recent studies on the male and female genitalia support the recognition of these genera.

Anthrax Scopoli

Anthrax Scopoli, 1763: 358. Type species: *Musca morio* Linnaeus, 1758 [misidentification, = *Musca anthrax* Schrank, 1781], by monotypy.

Chalcamoeba Sack, 1909: 522. Type species: *Anthrax virgo* Egger, 1859, by original designation.

Comments: Theodor (1983) recognised two groups of species based on differences in the genitalia. The first has males without spines on the cerci, gonocoxae truncate and epiphallus simple with a hooked apex (Fig. 111) and females with elongate club-shaped spermathecal bulbs with a broad looped duct and short sperm pumps. The second has males with spines on the cerci, gonocoxae with an elongate terminal process, and epiphallus with a complex apical structure (Fig. 112); females with heavily sclerotised spermathecal bulbs of various shapes, usually with narrow, straight ducts and longer sperm pump.

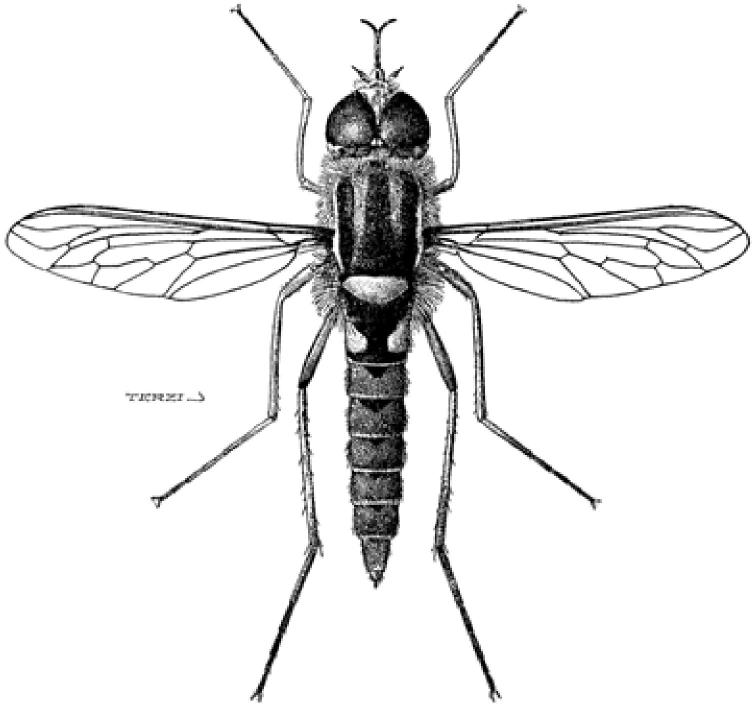


Fig. 86. *Antonia suavissima* Loew, male habitus (from Bezzi 1924).

Keys: Palaearctic, Engel (1932–7), Paramonov (1935); Egypt, El-Hawagry (1999*a*); Afrotropical, Bezzi (1924); Eritrea/northern Ethiopia, Greathead (1967); Ghana, Bowden (1964); Senegal, François (1972); southern Africa, Hesse (1956).

Hosts: Ectoparasitoids on the larvae of bees and wasps (du Merle 1975; Yeates & Greathead 1997).

Distribution: Cosmopolitan. North Africa: about 23 species, including Egypt: 2 recently described species; *Anthrax greatheadi* El-Hawagry and *A. moursyi* El-Hawagry (El-Hawagry 1999*b*) and Canary Islands: 2 species; *A. anthrax* (Schrank), *A. bowdeni.* Africa South of the Sahara: about 50 species: Aldabra and Socotra: members of the *A. dentata* (Becker) species complex, Seychelles: *A. distigma* Wiedemann.

Dicranoclista Bezzi

Dicranoclista Bezzi, 1924: 178. Type species: *Dicranoclista simpsoni* Bezzi, 1924, by original designation.

Comments: This genus has a strange disjunct distribution, with two African species and another two species present in the more arid parts of central and western North America. The male genitalia are similar to those of *Spogostylum* spp., but the females have globular or broad, tubular spermathecal bulbs and short ducts with well developed sperm pumps (Greathead 1993).

Key: Greathead (1993).

Distribution: Afrotropical and Nearctic Regions. Africa South of the Sahara: 2 species; *Dicranoclista auliae* Greathead (Sudan), *D. simpsoni* Bezzi (Gambia, Senegal).

Satyramoeba Sack

Satyramoeba Sack, 1909: 517. Type species: *Anthrax hetrusca* Fabricius, 1794, (as '*etrusca*') by original designation.

Meganthrax Evenhuis, 1979*b*: 362. Type species: *Anthrax bipunctata* Fabricius, 1805, by original designation.

Comments: Not yet recorded from Africa but the common species of the Mediterranean Basin, *Satyramoeba hetrusca* (Fabricius), is recorded from Spain and Israel and so may be expected to be discovered in North Africa eventually.

The male genitalia are similar to those *Spogostylum* spp. with an elongate aedeagus, but the aedeagus is comparatively shorter and the epiphallus larger; females also have similar, large balloon-like spermathecal bulbs, but with a short sclerotised base and short ducts.

Distribution: West and central Palaearctic and Oriental Regions.

Spogostylum Macquart

Spogostylum Macquart, 1840: 53 [1841: 331]. Type species: *Spogostylum mystaceum* Macquart, 1840 [misidentification, = *Anthrax tripunctata* Wiedemann, 1820], by monotypy.

Spongostylum Agassiz, 1846: 349 (unjustified emendation of *Spogostylum* Macquart, 1840). Type species: *Spogostylum mystaceum* Macquart, 1840 [misidentification, = *Anthrax tripunctata* Wiedemann, 1820], automatic.

Argyromoeba Schiner, 1860: 51. Type species: *Anthrax tripunctata* Wiedemann, 1820, by designation of Coquillett (1910: 510).

Argyramoeba Loew, 1869*b*: 228 [1872*a*: 114; 1872*b*: 290] (unjustified emendation of *Argyromoeba* Schiner 1860). Type species: *Anthrax tripunctata* Wiedemann, 1820, automatic.

Anthracamoeba Sack, 1909: 515. Type species: *Anthracamoeba obscura* Sack, 1909, by original designation.

Chrysamoeba Sack, 1909: 516. Type species: *Chrysamoeba vulpina* Sack, 1909, by original designation. [Preoccupied by Klebs, 1892.]

Leucamoeba Sack, 1909: 520. Type species: *Bibio aethiops* Fabricius, 1781, by original designation.

Molybdamoeba Sack, 1909: 510, 519. Type species: *Anthrax tripunctata* Wiedemann, 1820, by original designation.

Psamatamoeba Sack, 1909: 536. Type species: *Anthrax isis* Meigen, 1820, by original designation.

Coniomastix Enderlein, 1934: 140. Type species: *Coniomastix montana* Enderlein, 1934, by original designation.

Aureomoeba Evenhuis, 1978*b*: 247 (new replacement name for *Chrysamoeba* Sack, 1909). Type species: *Chrysamoeba vulpina* Sack, 1909, automatic.

Comments: Owing to confusion over the identity of the type species of *Spogostylum*, the name *Argyramoeba*, an objective synonym, was in widespread use by many authors e.g. Bowden (1964) and Hesse (1956) for species of this genus. Evenhuis (1985) gave a full account of the history of the underlying misconceptions.

Spogostylum spp. males have truncate gonocoxae, a normal-sized (Fig. 113) or very long slender aedeagus (Fig. 114), simple epiphalli with one or two hooks, and relatively small, weak apodemes, compared with *Anthrax* spp. Females have large, balloon-like spermathecal bulbs with, usually, sinuous ducts and no distinct sperm pump.

Keys: Palaearctic, Engel (1932–7), Paramonov (1957); Egypt, El-Hawagry (1999*a*); Afrotropical, Bezzi (1924); Eritrea/northern Ethiopia, Greathead (1967); Ghana, Bowden (1964 as *Argyramoeba*); Senegal, François (1972 as *Argyramoeba*); southern Africa, Hesse (1956 as *Argyramoeba*).

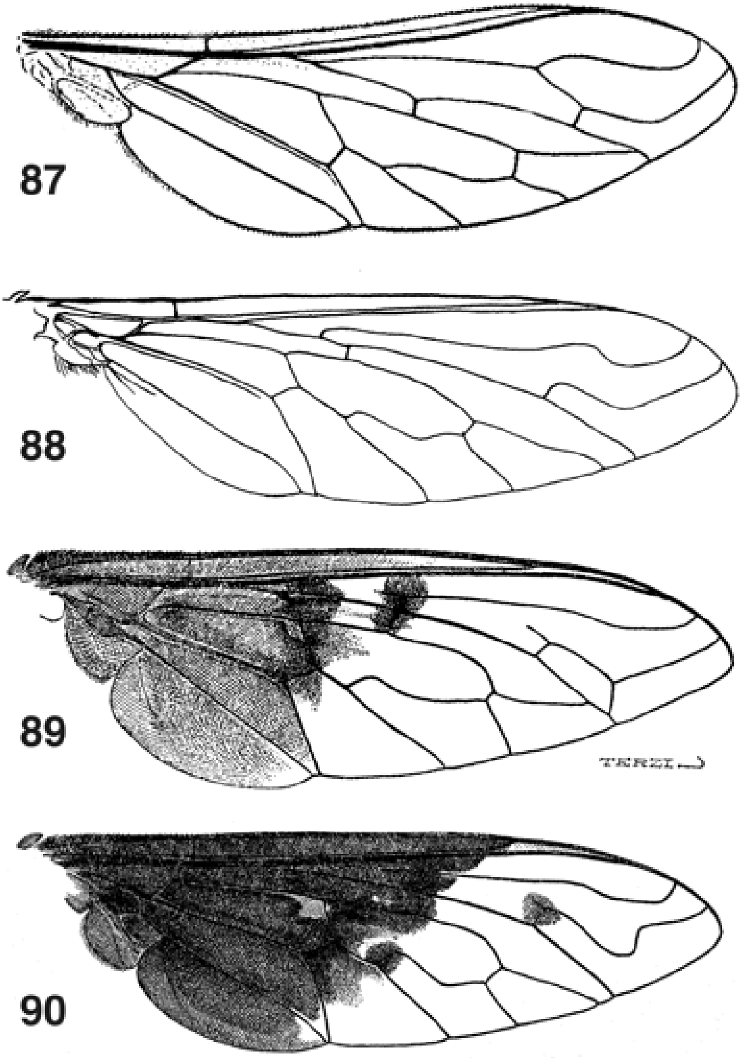
Hosts: Ectoparasitoids of solitary bees and wasps, predators in egg-pods of Acrididae and also reared from a pyralid, *Loxostege frustalis* Zeller, and its parasitoids (du Merle 1975; Yeates & Greathead 1997).

Distribution: Afrotropical, Palaearctic and Oriental Regions. North Africa: 9 species, including Canary Islands: 1 species; *S. trinotatum* Dufour. Africa South of the Sahara: 19 species.

Turkmeniella Paramonov

Turkmeniella Paramonov, 1940*a*: 44. Type species: *Turkmeniella magnifica* Paramonov, 1940, by monotypy.

Comments: The two known species of this genus, known only from five specimens, were found in widely separated parts of the southern Palaearctic Region. The male genitalia of *T. crosi* are *Spogostylum*-like; those of the females have not been described.



Figs 87–90. Bombyliidae wings. 87. *Pteraulax flexicornis* Bezzi (from Hesse 1956). 88. *Petrorossia letho* (Wiedemann) (from Hull 1973). 89. *Dicranoclista simpsoni* Bezzi. 90. *Anthrax aygulus* Fabricius (all from Bezzi 1924).

Hosts: *Turkmeniella crosi* has been reared from the nest of an *Anthocopa* sp. in Algeria (du Merle 1975).

Distribution: Turkmenistan and Maghreb. North Africa: Algeria, Morocco: 1 species; *Turkmeniella crosi* (Villeneuve).

Aphoebantini Becker

Type genus: *Aphoebantus* Loew, 1872.

This is possibly the most plesiomorphic tribe of Anthracinae. The genera contained in it were included in the Lomatiinae by Bezzi (1924) and Hesse (1956), but transferred to the Anthracinae by Bowden (1980). It is characterised by the presence of an indented eye with bisecting line, two-segmented palpi, costal hook present, R_{2+3} arising at an acute angle close to the origin of Rs.

Aphoebantus Loew

Aphoebantus Loew, 1872*a*: 77 [1872*b*: 253]. Type species: *Aphoebantus cervinus* Loew, 1872, by monotypy.

Comments: *Aphoebantus* is a predominantly North American genus and is probably paraphyletic. The western palaearctic and afrotropical species examined by Greathead (1996*a*) were transferred to the genus *Cononedys* Hermann. The remaining species require re-examination to determine whether they too are *Cononedys* spp.

Keys: Palaearctic, Engel (1932–7), Paramonov (1929).

Hosts: Some North American species are predators in the egg-pods of Acrididae (Greathead 1963; du Merle 1975). Females in North America have been observed by NLE ovipositing in fine sand under manzanita bushes (*Arctostaphylos* spp.). They dig a small pit in the sand with the tip of the abdomen, lay 4–5 eggs, and then cover the pit with sand with the tip of the abdomen. Unfortunately, laboratory rearing of the eggs taken from these pits proved unsuccessful.

Distribution: Nearctic and ?Palaearctic Regions. North Africa: Egypt: ?1 species; *Aphoebantus wadensis* Bezzi.

Cononedys Hermann

Cononedys Hermann, 1907: 197. Type species: *Anthrax stenura* Loew, 1871, by original designation.
Conogaster Hermann, 1907: 199. Type species: *Conogaster erythraspis* Hermann, 1907, by monotypy. [Preoccupied by Brauer & Bergenstamm, 1891.]

Comments: All the western palaearctic and afrotropical *Aphoebantus* species examined by Greathead (1996*a*) were found to belong to the genus *Cononedys*.

Key: Palaearctic, Engel (1932–7), Paramonov (1929) both as *Aphoebantus*.

Distribution: Western Palaearctic Region and north-eastern Afrotropical Region. North Africa: 5 species; *Cononedys bituberculata* Becker (Tunisia), *C. dichromatopa* (Bezzi) (Egypt), *C. efflatouni* (Bezzi) (Egypt), *C. escheri* (Bezzi) (Algeria, Tunisia, Egypt), *C. lyneborgi* (François) (Morocco). Africa South of the Sahara: 2 species; *C. bilobata* (Bezzi) (Ethiopia), *C. inornata* (Greathead) (Eritrea).

Pteraulacodes Hesse

Pteraulacodes Hesse, 1956: 348. Type species: *Pteraulacodes karooensis* Hesse, 1956, by original designation.

Key: Hesse (1956).

Distribution: Southern Afrotropical: 2 species; *Pteraulacodes hessei* Lindner (Namibia), *P. karooensis* Hesse (Eastern, Western and Northern Cape).

Pteraulax Bezzi

Pteraulax Bezzi, 1921*a*: 117. Type species: *Pteraulax flexicornis* Bezzi, 1921, by original designation.

Key: Hesse (1956).

Distribution: Southern Africa and Iran. Afrotropical: 8 species.

Exoprosopini Becker

Type genus: *Exoprosopa* Macquart, 1840.

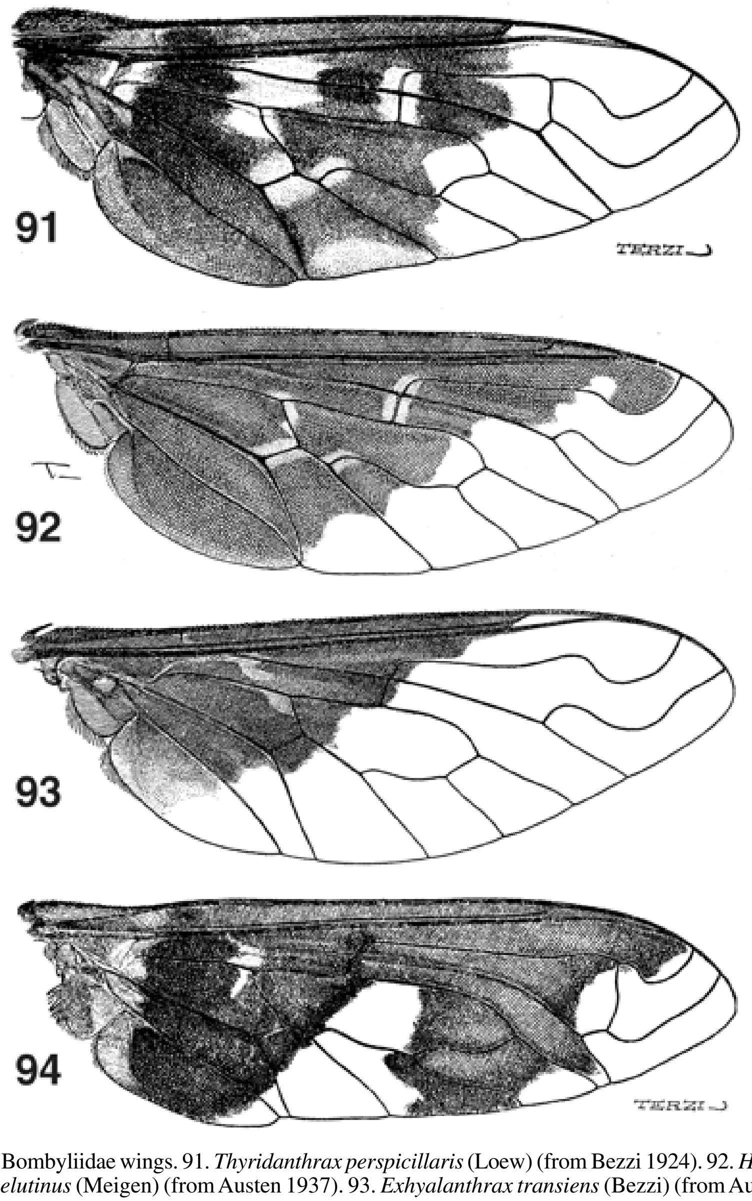
The tribe is characterised by having spine-like pulvilli, which separates it from the otherwise similar Villini. The Exoprosopini also invariably have an interradial crossvein (at least three submarginal cells), usually have two flagellomeres, and are, mostly, larger than Villini.

Bezzi (1924) included the genera now placed in the Exoprosopini (along with those comprising the Villini) in a subfamily Exoprosopinae. He included three of the genera, *Exoprosopa*, *Litorhina* (as *Litorrhynchus*) and *Ligyra* (as *Hyperalonia*) presently included in the Exoprosopini. He divided the very large and diverse genus *Exoprosopa* into subgenera, based chiefly on details of the wing venation. Hesse (1956) followed Bezzi, but proposed one additional genus, *Atrichochira*. Bowden (1962 1964) described *Diatropomma* and *Micomitra*. Later, Bowden (1975*b*) revived *Heteralonia* and extended its scope to include species of *Exoprosopa* with similar male genitalia. As redefined, most of Bezzi's subgenera of *Exoprosopa* became subgenera of *Heteralonia*. Some authors did not accept Bowden's (1980) allocation of species, but subsequent studies, notably on female genitalia (Theodor 1983), have shown that he was correct. However, *Exoprosopa* still remained a very large and diverse, paraphyletic assemblage of species. A recent cladistic analysis of a range of species of Exoprosopini, including all recognised genera and many from Africa and Asia representing Bezzi's and Hesse's species groups of *Exoprosopa*, was carried out by Lambkin (2001) in connection with a revision of the Australian Exoprosopini. Her work confirms Bowden's interpretation of *Heteralonia*, and also that *Atrichochira*, *Diatropomma*, *Litorhina* and *Micomitra* are monophyletic genera. However, African species presently included in *Ligyra* form a clade, separate from that comprising *Ligyra sensu stricto*. It also confirms the paraphyly of *Exoprosopa*, and suggests that the majority of African species should be transferred to other genera, a conclusion suggested by other preliminary studies and cladistic analyses (Greathead 2001*a* and unpublished) of African Exoprosopini.

Atrichochira Hesse

Atrichochira Hesse, 1956: 911. Type species: *Exoprosopa pediformis* Bezzi, 1921, by original designation.

Comments: The male and female genitalia are very similar to those of *Micomitra*



Figs 91–94. Bombyliidae wings. 91. *Thyridanthrax perspicillaris* (Loew) (from Bezzi 1924). 92. *Hemipenthes velutinus* (Meigen) (from Austen 1937). 93. *Exhyalanthrax transiens* (Bezzi) (from Austen 1929). 94. *Litorhina dentifera* (Bezzi) (from Bezzi 1924).

spp., but quite distinct from other African Exoprosopini. The two form a well supported clade along with the Australian genus *Pseudopenthes* Roberts (Lambkin 2001).

Distribution: Afrotropical: 2 species; *Atrichochira inermis* (Bezzi) (Malawi), *A. pediformis* (Bezzi) (Burundi, Malawi, KwaZulu-Natal). A further undescribed species from Madagascar has been seen by DJG.

Diatropomma Bowden

Comments: This small genus, comprising three species, is known only from eastern Africa. The species are readily distinguished from other Exoprosopini, being slender, dark in colour and with petiolate and infuscated wings. As remarked by François (1960), they resemble species of *Baccha* (Syrphidae) and are weak fliers. All three occur in arid savanna and thicket areas.

Key: See below.

Distribution: Afrotropical: 3 species, see below.

Key to species of *Diatropomma*

1 Scales on thorax predominantly ochreous to golden, abdomen with extensive ochreous to golden scales 2

– Scales on thorax predominantly black, abdomen with a pattern of black and white scales .... Kenya; **carcassoni** Bowden

2 Abdomen with bands of black and ochreous scales, wing pattern less extensive, with a clear spot near the apex of cell cup .... Burundi; **claudia** (François)

– Abdomen uniformly covered in dull golden yellow scales, wing pattern more extensive, with cell cup uniformly infuscated ....
Tanzania; **annettae** Greathead and Evenhuis, sp. n.

Diatropomma annettae Greathead and Evenhuis **sp. n.**

(Fig. 124)

Etymology: Named for Annette Greathead who collected part of the type series, and following François (1960) whose species was also named after his wife.

Material examined: Holotype ♂. TANZANIA: 70 miles N of Dodoma, 2.v.1966 (D. & A. Greathead) (BMNH). Paratypes. TANZANIA: 80 miles N of Dodoma, 2.v.1966, 1♂1♀ (A. H. Greathead); 20 miles E Dodoma, 26.iv.1967, 1♀ (D. J. Greathead) (BMNH & DJG).

Diagnosis: This new species can be distinguished from the two previously described species by the preceding couplets.

Description: Holotype ♂. Length of body 9 mm; proboscis 2.5 mm; wing 11 mm. *Head*: Black, pale brownish inside oral cavity and on ventral part of genae. Eyes at vertex separated by about twice width of ocellar triangle which is set forward of vertex. Hair black. Frons and face with sparse deep golden scales. Occiput with a dense band of pale golden scales on the upper part of the eye margin. Antennae with the flagellum twisted as *D. carcassoni* (Bowden 1962: Fig. 2). Scape black, pedicel brown, flagellum yellow-brown and with gold tomentum, all hairs black. Proboscis blackish-brown. Palpi blackish with black hairs. *Thorax*: Black with brown tomentum. Hair very sparse, except on fore margin of mesothorax (collar), black except for golden ones above on fore margin of mesothorax. Mesonotum and scutellum with small sparse dull golden-yellow scales. Pleura without scales. *Legs*: Coxae and femora dark brown and with black scales, tibiae yellow-brown with dull gold scales, tarsi brown. All hair and bristles black, except for yellow-brown ones on fore tarsi above. Fore and mid femora without bristles, hind each with three antero-ventral ones. Claws almost straight, black. *Wing*: Venation as other two species. Infuscated brown with apex infused paler brown. Pattern almost as *D. carcassoni* (Bowden 1962: Fig. 4) but cell cua1 (fourth posterior) infuscate at apex so that the central clear area is more rectangular in outline, and pale spots at apex of discal cell wanting. Costal hook black, comb black with golden scales. Squama blackish, with a fringe of minute yellowish scales. Halter blackish brown. *Abdomen*: Black. Hairs sparse, black, uniformly covered in small dull golden-yellow scales. *Male genitalia* (Fig. 124): Dark brown, very similar to *D. carcassoni* but epiphallus more rounded at apex.

Paratype ♀. Vestiture as in holotype, except that femora have extensive golden scaling. Wing pattern sexually dimorphic (as in *D. claudia*, François, 1960: Figs 1–2) with larger and more conspicuous pale spots, including one on crossvein m-m. Ovipositor with yellow hair and blackish spines.

Exoprosopa Macquart

Exoprosopa Macquart, 1840: 35 [1841: 313]. Type species: *Anthrax pandora* Fabricius, 1805, by subsequent designation (Coquillett, 1910: 544) [Designation conserved by Opinion 1632 (I.C.Z.N., 1991: 82).]

Litorhynchus Macquart, 1840: 78 [1841: 356]. Type species: *Litorhynchus hamatus* Macquart, 1840 [= *Anthrax heros* Wiedemann, 1819], by subsequent designation (Coquillett, 1910: 562).

Trinaria Mulsant, 1852: 20. Type species: *Anthrax interrupta* Mulsant, 1852 [= *Anthrax rutila* Pallas & Wiedemann, 1818], by subsequent designation (Coquillett, 1910: 617).

Argyrospila Rondani, 1856: 162, 202. Type species: *Anthrax jacchus* Fabricius, 1805, by original designation (as '*jaccus*').

Defilippia Lioy, 1864: 733. Type species: *Anthrax minos* Meigen, 1804, by subsequent designation (Griffini, 1896: 42).

Litorrhynchus Verrall *in* Scudder, 1882: 192 (unjustified emendation of *Litorhynchus* Macquart, 1840). Type species: *Litorhynchus hamatus* Macquart, 1840 [= *Anthrax heros* Wiedemann, 1819], automatic.

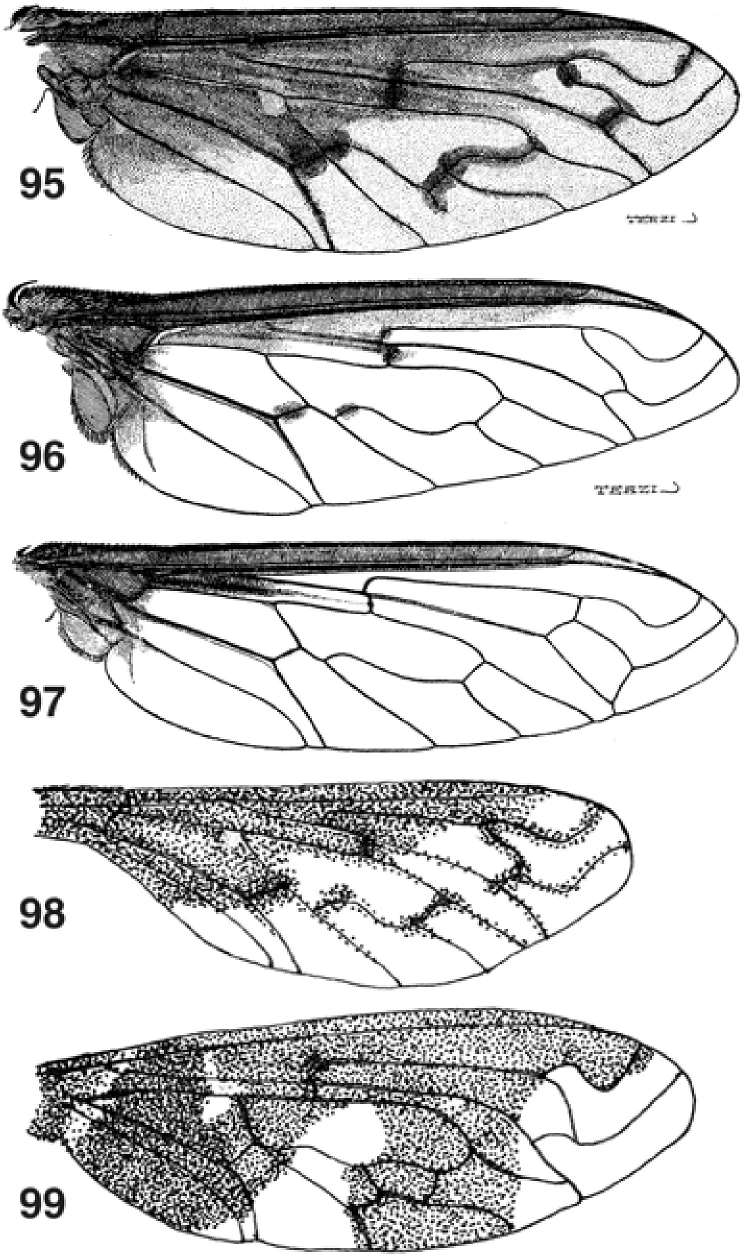
Litomyza Hull, 1973: 426. Type species: *Litorhynchus hamatus* Macquart, 1840 [= *Anthrax heros* Wiedemann, 1819], by subsequent designation (Evenhuis, 1991: 48). *Nomen nudum.*

Comments: In spite of the removal of several of Bezzi's (1924) subgenera and species groups, *Exoprosopa* remains a very large genus, which is particularly diverse and speciose in the Afrotropical Region. There remains a bewildering diversity of wing patterns and vestiture, as a result of convergent evolution of cryptic and disruptive colour patterns (Lambkin 2001), that are not congruent with differences in male and female genitalia, which are considered to be of phylogenetic significance.

Keys: Palaearctic, Engel (1932–7), Paramonov (1928); Afrotropical, Bezzi (1924); Ghana, Bowden (1964); Senegal, François (1972); *Exoprosopa busiris* group, Greathead (2001*a*).

Hosts: There are a few records of rearings from cocoons of Hymenoptera, and some dubious records (du Merle 1975).

Distribution: Cosmopolitan. Palaearctic. North Africa: about 16 species. Africa South of the Sahara: 172 species, including new species described below. Cape Verde Islands: 1 species; *E. biguttata* (Macquart). Socotra: 1 species; *Exoprosopa guttipennis* Bezzi. Aldabra: 1 species; *E. aldabrae* Greathead. Madagascar: 7 species.



Figs 95–99. Bombyliidae wings. 95. *Heteralonia spoliata* (Bezzi). 96. *Exoprosopa batrachoides* Bezzi. 97. *Ligyra atricosta* Bezzi (all from Bezzi 1924). 98. *Heteralonia azaniae* Greathead and Evenhuis sp. n. 99. *Exoprosopa enigma* Greathead and Evenhuis sp. n.

Exoprosopa enigma Greathead and Evenhuis **sp. n.**

(Figs 99, 121–122)

Material examined: Holotype ♂. NAMIBIA: Etosha Nat. Park, Kaross, 19°23'S14°32'E, 9–10.v.1987 (J. Irish & E. Marais). Paratype females. 2♀, as holotype; 1♂, Damaraland, Duineveld 529, SE2014Dc, 14–16.v.1978 (M. -L. Penrith & S. Louw) H36195. All in NMWN.

Diagnosis: This species bears a strong resemblance to species of *Litorhina* in body colour, vestiture, venation, and wing pattern. However, it differs in having a conically produced face and relatively short proboscis, and in the consistent presence of supernumerary crossveins that divide cell m_2 into three cells. The shape of the spermathecal bulb is also similar to that of *Litorhina* spp., but the size and structure of the male genitalia are closer to species of *Exoprosopa*.

Description: Holotype ♂. Length of body 13 mm, of wing 14 mm. *Head*: Orange-brown, except for black markings forming a line between the eyes behind the ocellar triangle, a spot on the underside posterior to the oral cavity and the inside of the occipital concavity. Short hairs on vertex, frons and face black but some yellowish ones intermixed on margin of oral cavity, also short decumbent black hairs on occiput. Margin of occipital concavity with a fringe of pale yellowish hair. Sparse scales on frons and face and a band of scales on the posterior margins of the eyes pale yellowish. Vertex 3 x width of ocellar triangle. *Antenna*: Scape 2 x length of pedicel, both orange brown and with short black hairs. Flagellum with first flagellomere grey-brown, elongate conical and slightly longer than scape and pedicel combined, second flagellomere yellow, styliform and 1.5 x length of pedicel. Proboscis black, labellae projecting beyond facial cone. Palpi pale yellowish. *Thorax*: Mesonotum, most of anepisternum and fore part of anepimeron black, remainder of pleura and postpronotal lobes brown and scutellum red-brown. Bristles, black, strongly developed. Short hairs on mesonotum brown and longer hairs at front, along notopleural line and on pleura pale yellowish. *Legs*: Brown. Bristly hair on coxae, claws and bristles black. *Wing* (Fig. 99): Veins and costal hook brown, costal comb black. Terminal segment of R_{2+3} strongly S-shaped, cell r_5 closed and with a stalk, M_2 bent towards apex of wing so that cell m_2 is more than twice width of cell m_1 at margin, and cell m_2 divided into three by crossveins (to give 6 posterior cells). With a striking *Litorhina*-like brown infuscation which at its apical margin completely fills cell r_1 and extends into apex of cell r_{2+3} at its anterior margin, runs straight to hind margin at end of M_2. Clear area in middle of discal cell extends to hind margin, also with clear spots in cells br and bm and along vein MA. Squama brown with a white fringe. Halter brown with an ivory knob. *Abdomen*: Red-brown with median black triangular spots at fore margins of terga 1–6; short black hairs on terga 2–7; first tergum, sides of terga 2–6 and hind margin of 7 with whitish hair. Sterna with whitish hair. *Male genitalia* (Fig. 121): Epandrium with black hair and gonocoxae with red-brown hair. Gonocoxae relatively large, with a line of weakness in the middle and a row of strong spines distal to it. Epiphallus large and curve ventrally. All apodemes large and robust.

Paratype ♀. As male but head brown, black areas on abdominal terga more extensive reaching sides of abdomen; vertex 5 x width of ocellar triangle. Spermatheca (Fig. 122) with terminal bulb elongate.

Heteralonia Rondani

Heteralonia Rondani, 1863: 57 [1864: 57]. Type species: *Exoprosopa oculata* Macquart, 1840 (as '*occulta*'), by monotypy.

Comments: *Heteralonia* was erected to contain species of *Exoprosopa* with cell r_{2+3} divided into two by a crossvein. Bowden (1975*b*) found that species in other subgenera of *Exoprosopa sensu* Bezzi (1924) (*Acrodisca*, some *Defilippia*, *Isotamia, Mesoclis, Metapenta* and *Zygodipla*) all have small male genitalia with a simple axe-head shaped epiphallus and weak ejaculatory apodeme, concealed between the fused gonocoxae, as well as a tendency toward unstable wing venation, a characteristic dark wing pattern and dark vestiture. Consequently, he grouped all these species in *Heteralonia*, and divided it into subgenera based on wing venation and the degree of reduction of the front legs. His revised concept of *Heteralonia* was misinterpreted by some authors, who found the characters ambiguous, and therefore doubted its validity or reduced its scope to include only some of the subgenera. However, it has been found that species of *Heteralonia sensu* Bowden all have a similar spermathecal shape – small with narrow, tubular, thick-walled, unpigmented bulbs – which provides an unambiguous apomorphy to define the genus. The subgeneric characters, if interpreted strictly, produce some anomalies: some southern African *Acrodisca*-like species lacking the appendix (and so appear to belong strictly to *Homolonia*) have the typical wing-pattern, body size and coloration of *Acrodisca* spp.; similarly, some Arabian *Zygodipla*-like species lack either a divided or closed cell r_5, but have the wing pattern and coloration of this subgenus; some Indian species can be placed in either *Acrodisca* or *Isotamia*, having the characters of both subgenera, and so on. Thus, the subgenera of *Heteralonia* are ill-defined, and are retained only as an aid to identification; the number of species in each is open to interpretation.

Keys: Palaearctic, Engel (1932–7), Paramonov (1928); Afrotropical, Bezzi (1924); Ghana, Bowden (1964); Eritrea/northern Ethiopia, Greathead (1967); Senegal, François (1972); southern Africa, Hesse (1956) all as *Exoprosopa*.

Hosts: One reliable record only, from the cocoon of a pompilid (Yeates & Greathead 1997). The record from a locust (du Merle 1975) is dubious.

Subgenus *Acrodisca* Bezzi

Acrodisca Bezzi, 1921*a*: 138, 139 [1922*a*: 85; 1923: 332; 1924: 234] (as subgenus of *Exoprosopa* Macquart). Type species: *Exoprosopa angulata* Loew, 1860, by subsequent designation (Bezzi, 1924: 234).
Cladodisca Bezzi, 1922*b*: 105 [1922*c*: 143–44; 1923: 332; 1924: 143] (as subgenus of *Exoprosopa* Macquart). Type species: *Exoprosopa munda* Loew, 1869, by monotypy.

Distribution: Afrotropical, Palaearctic and Oriental Regions. North Africa: Egypt: 1 species; *Heteralonia serpentata* (Klug). Africa South of the Sahara: 23 species. Socotra: 1 species; *H. insularis* (Ricardo).

Subgenus *Heteralonia* Macquart

Distribution: Afrotropical Region: 2 species; *Heteralonia oculata* Macquart (Senegal to Eritrea and East Africa), *H. kaokoensis* (Hesse) (Namibia).

Subgenus *Homolonia* Bowden

Mima Meigen, 1820: 175. Type species: *Anthrax phaeoptera* Wiedemann, 1820, by subsequent designation (Coquillett, 1910: 570).

Homolonia Bowden, 1975*b*: 319. Type species: *Anthrax megerlei* Meigen, 1820, by original designation.
[*Mima* was originally proposed in synonymy but was made available by Coquillett's (1910: 570) type designation and treatment of it as a senior synonym of *Exoprosopa* Macquart. Despite its being an available name, the type species of *Mima* could not be recognized until recently because of its vague original description. Publication of Meigen's color plates (Morge, 1976) confirms the identity of *Anthrax phaeoptera* as very similar to, if not the same as, *Anthrax megerlei* Meigen, 1820, the type species for *Homolonia* Bowden, 1975. To accept the generic concept of *Mima* would cause instability in the taxonomy of this group of flies. Until an application is submitted to the I.C.Z.N. to formally suppress *Mima* in favor of *Homolonia*, this paper treats *Homolonia* as the valid genus-group name for this group of flies.]

Distribution: Afrotropical, Palaearctic and Oriental Regions. North Africa: 3 species; *Heteralonia aegina* (Wiedemann), *H. megerlei* (Meigen), *H. vesperugo* (Costa). Africa South of the Sahara: 21 species. Madagascar: 1 species; *H. dolichoptera* (Bezzi).

Subgenus *Isotamia* Bezzi

Isotamia Bezzi, 1912: 606, 627 (as genus). Type species: *Isotamia daveyi* Bezzi, 1912, by original designation.
Francoisia Hesse, 1952: 1 (as genus). Type species: *Francoisia sulcifacies* Hesse, 1952 [= *Isotamia daveyi* Bezzi, 1912], by original designation.
Ogilviella Paramonov, 1954: 26 (as genus). Type species: *Ogilviella tridentata* Paramonov, 1954 [= *Isotamia daveyi* Bezzi, 1912], by monotypy.
Stenolonia Bowden, 1975*b*: 319. Type species: *Exoprosopa loxospila* Hesse, 1956, by original designation.

Distribution: Africa and Oriental Regions. North Africa: Egypt: 1 species; *Heteralonia spiloneura* (Bezzi). Africa South of the Sahara: 6 species, including the following new species.

Heteralonia (Isotamia) azaniae Greathead and Evenhuis **sp. n.**

(Figs 98, 123)

Material examined: Holotype ♂. KENYA: Mau Summit, 7.x.1975 (D. J. Greathead) (BMNH). Paratypes. KENYA: 1♂1♀, as holotype; near Gil-Gil, 5.xi.1975, 2♂1♀ (D. J. Greathead); Elburgon, 7.x.1975, 2♀ (D. J. Greathead); Rongai, 11.x.1975, 1♀ (D. J.

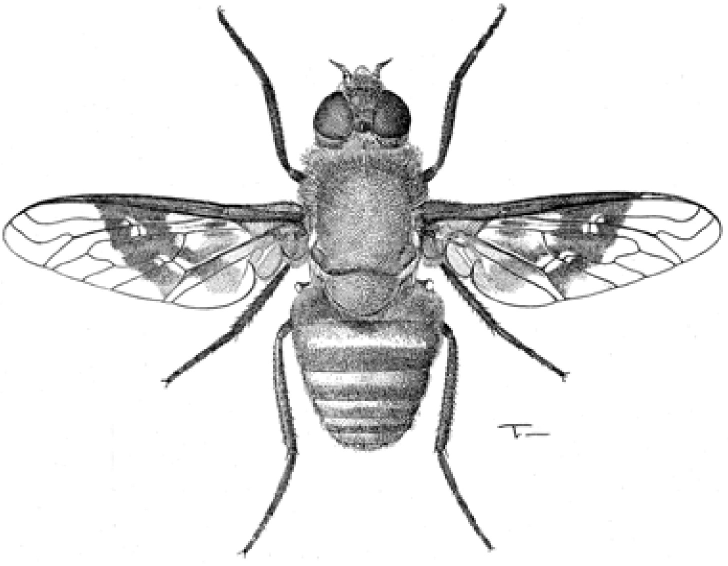


Fig. 100. *Thyridanthrax polyphemus* (Wiedemann), male habitus (from Austen 1937).

Greathead) (all DJG); Masai Reserve, 23.iv.1913, 2♂ (T. J. Anderson); Nyeri (S), 12.iv.1945, 1♂1♀ (van Someren); Chulyu Hills, 5200 feet, iv.1938, 2♂ (Coryndon Mus. Exped.) (all BMNH). TANZANIA: near Kolo N of Kondoa, 15.v.1968, 1♂ (D. J. Greathead) (DJG). Also seen in collection of J. Bowden, a series from Uganda: Sebei, Ngege, 26.viii.1959 (J. Bowden).

Diagnosis: This is a very variable species, as is the subgenotype *H.* (*Isotamia*) *daveyi* (Bezzi). It is larger than that species and has more extensive brownish scaling and distinct spots on the crossveins in the pale part of the wings, as does *H. loxospila* Hesse and *H. ceuthodonta* Hesse, but these species have vein R_{2+3} originating much closer to crossvein r-m, and do not have the faint infuscation along the margins of the veins at the wing margin.

Description: Holotype ♂. Length 9.5 mm; proboscis 3 mm; wing 11.5 mm. *Head*: Black, but brown inside oral cavity and with paler brownish areas on genae. Eyes at vertex separated by more than 3 x width of ocellar triangle which is narrow and elongate. Face broad and longitudinal groove conspicuous. Frons and face with dense fine black hair and a tuft of flattened black hairs at apex of facial cone, scales shining reddish-brown. Occiput with mixed black and yellow hair and glittering reddish scales. *Antenna*: Brownish black. First flagellomere conical, equal in length to scape and pedicel combined, and with a stout flattened second flagellomere of equal length terminating in a transparent style. Proboscis almost twice length of head, black. Palpi black with long sparse black hairs. *Thorax*: Black. Hair black with a few orange-yellow ones intermixed, especially towards the anterior margin, that at anterior margin (collar) dull yellow. Scales reddish-brown with some intermixed black ones. Pleura with patches of flattened scale-like hairs above mid coxae. Plumula weak, white. *Legs*: brownish-black. Bristles and spicules well developed, black. Fore tibiae spiculate and hind femora with a complete ventral row of strong bristles. Scales dense, black with a few reddish ones intermixed, glossy or matt depending on angle of incident light. Claws, black, long, slender and rather straight. *Wing* (Fig. 98): Basicostal infuscation and spots dark brown and paler brown borders to longitudinal veins in clearer part of wing. Clearer part tinged greyish-brown. Costal hook and comb black. Squama brownish-black with a fringe of small orange scales. Halter blackish. *Abdomen*: Black. Hair black, very sparse except at sides of first tergum. Scaling dense, mainly black, forming a fringe at sides, except on first tergum. White scales forming irregular spots at sides and on mid-line of terga 2–6 and across base of seven, also with some orange-brown scales across the base of second tergum and scattered among the black ones elsewhere. Sterna with black hair and scales, with a few orange scales intermixed and at margins of sterna. *Male genitalia* (Fig. 123): Small, inconspicuous, black. Epiphallus spatulate.

Paratype ♀. As holotype, even eyes no more widely separated at vertex. Spermathecae very small thick-walled, tubular, pointed at apex.

Remarks: Specimens vary in the extent of the admixture of orange hair and scales and the amount of white scaling on the abdomen. The wing varies in the size of the spots (larger in Uganda specimens) and the intensity of the dark borders to the veins (absent in the Tanzania specimen).

The other eastern African species of *Isotamia* are all found in relatively arid savannas among short grass (DJG, unpublished observations); however, this species was collected at localities over 1500 m in relatively humid areas.

Subgenus *Mesoclis* Bezzi

Mesoclis Bezzi, 1921*a*: 139 [1922*b*: 105; 1922*c*: 143; 1924: 228, 229] (as subgenus of *Exoprosopa* Macquart). Type species: *Anthrax pygmalion* Fabricius, 1805, by original designation (as '*varinerius-pygmalian*, Fabr.').

Distribution: Monotypic. Mediterranean Basin including North Africa: *Heteralonia pygmalion* (Fabricius).

Subgenus *Metapenta* Bezzi

Metapenta Bezzi, 1921*a*: 138, 139 [1922*a*: 84; 1923: 330; 1924: 230] (as subgenus of *Exoprosopa*). Type species: *Exoprosopa pentala* Macquart, 1840, by subsequent designation (Bezzi, 1924: 230).

Distribution: Afrotropical Region: 10 species.

Subgenus *Zygodipla* Bezzi

Zygodipla Bezzi, 1924: 244 (as subgenus of *Exoprosopa* Macquart) [1926: 268 (as genus)]. Type species: *Anthrax algira* Fabricius, 1794, by original designation.

Corycetta Hull, 1973: 413 (as subgenus of *Exoprosopa* Macquart). Type species: *Exoprosopa subfasciata* Engel, 1936, by original designation.

Distribution: Mainly Palaearctic and Oriental Regions, also Yemen. North Africa: 9 species. Africa South of the Sahara: 3 species; *Heteralonia suavipennis* (Macquart) (Gambia-Senegal, Cape Verde Islands), *H. tephroleuca* (Loew) (Sudan), *H. mira* Greathead (Namibia) (Greathead 2001*a*).

Ligyra Newman

Ligyra Newman, 1841: 220. Type species: *Anthrax bombyliformis* Macleay, 1826, by monotypy.

Paranthrax Paramonov, 1931: 57. Type species: *Paranthrax africanus* Paramonov, 1931 [= *Hyperalonia niveifrons* Bezzi, 1914], by monotypy. [Preoccupied by *Paranthrax* Bigot, 1876.]

Paranthracina Paramonov, 1933: 56 [1934: 27; 1936: 31] (replacement name for *Paranthrax* Paramonov, 1931). Type species: *Paranthrax africanus* Paramonov, 1931 [= *Hyperalonia niveifrons* Bezzi, 1914], automatic.

Comments: This genus rests on a single apomorphy: cell r_4 divided by a crossvein (thus making four submarginal cells). In all other respects, the characters are found in species of *Exoprosopa*, and indeed some species of the two genera are remarkably similar in appearance, which has led to doubts as to the validity of the genus. There are fewer species in Africa than of *Exoprosopa* or *Heteralonia*, but further east in south-east Asia and Australia it is the most speciose genus of Exoprosopini. However, Lambkin (2001) has shown that the African species included in *Ligyra* do not belong to this genus, and will eventually have to be transferred to one or more new genera.

Keys: Afrotropical, Bezzi (1924); southern Africa, Hesse (1956) both as *Hyperalonia*. Ghana, Bowden (1964); Senegal, François (1972).

Hosts: Parasitoids of the pupae of Scoliidae and Tiphiidae (du Merle 1975). No records from Africa.

Distribution: Cosmopolitan except Oceanic Region, and not recorded from North Africa. Africa South of the Sahara: 23 species.

Litorhina Bowden

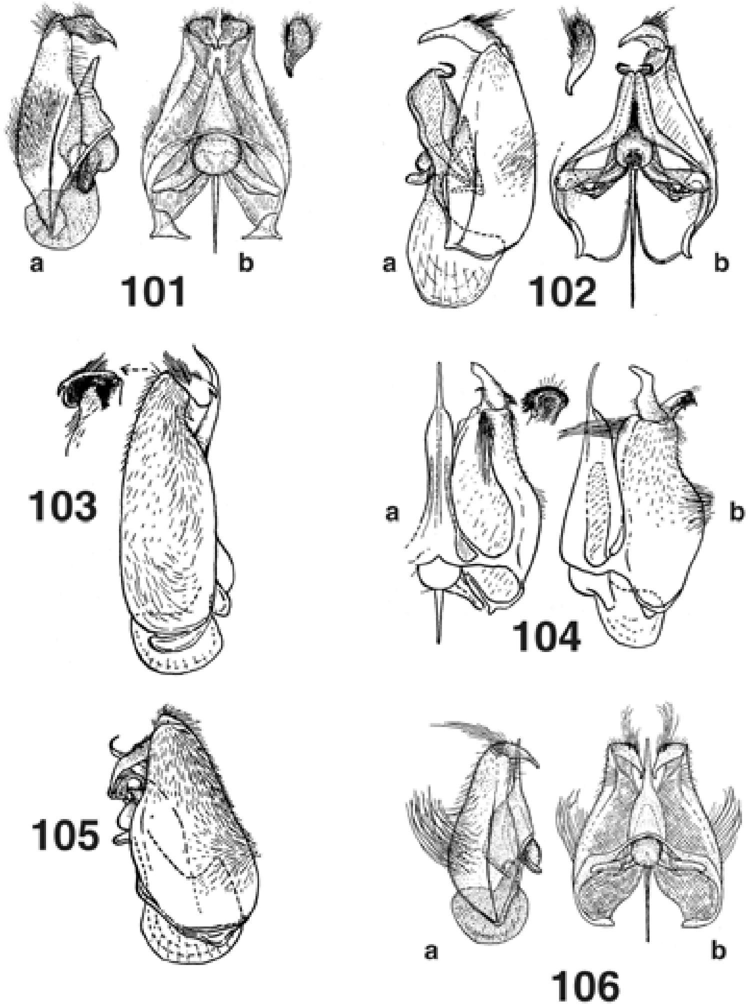
Litorhina Bowden, 1975*b*: 314. Type species: *Litorhynchus corticeus* Bezzi, 1924, by original designation

Exosoma Séguy, 1938*a*: 333. Type species: *Litorhynchus erythraeus* Bezzi, 1906 (as '*Exosoma erythraea* Séguy'), by monotypy. [Unavailable; name proposed in synonymy with *Tanyglossa maurus* Thunberg and not made available before 1961.] [Preoccupied by Jacoby, 1903.]

Comments: Bowden (1975*b*) explained the complex history of the name *Litorhynchus* Macquart. It had become familiar from the work of Bezzi (e.g. 1924), Hesse (1956) and others, for this distinctive African genus, but it is in fact a synonym of *Exoprosopa* Macquart, so a new name was required.

Keys: Afrotropical, Bezzi (1924); Senegal, François (1972); southern Africa, Hesse (1956), all as *Litorhynchus*.

Hosts: Recorded from Tiphiidae (once) and nests of Sphecidae (twice) (du Merle 1975; Yeates & Greathead 1997).



Figs 101–106. Bombyliidae male genitalia. 101. *Bombomyia bombiformis* (Bezzi). *a*. lateral view. *b*. ventral view. 102. *Bombylisoma senegalense* (Macquart). *a*. lateral view. *b*. ventral view. 103. *Gonarthrus kalaharicus* Hesse. 104. *Eurycarenus dichopticum* Bezzi. *a*. lateral view. *b*. ventral view. 105. *Systoechus mixtus* (Wiedemann). 106. *Beckerellus terminatus* (Becker). *a*. lateral view. *b*. ventral view (all from Hesse 1938).

Distribution: Afrotropical Region eastwards to India, but not recorded from North Africa. Africa South of the Sahara: 37 species, including the following new species.

Litorhina flammea Greathead and Evenhuis **sp. n.**

Etymology: Derived from the Latin *flammeus*, fiery, in reference to the bright orange vestiture on the front of the thorax and apex of the abdomen.

Material examined: Holotype ♂: SIERRA LEONE: Freetown, Cape Sierra Hotel area, 8°31'N 13°17'W, 19.xi.1993, loc. 2, on windows (Lund University Sierra Leone Expedition 1993; L. Caderholm, R. Danielsson & R. Hall) (MZLU). Paratype ♂: SIERRA LEONE: Charlotte Village, SE of Freetown, 8°25'N 13°12'W, 22.xi.1993, loc. 6, at light (Lund University Sierra Leone Expedition 1993; L. Caderholm, R. Danielsson & R. Hall) (MZLU).

Diagnosis: This is a very distinctive species, unlike any other afrotropical species in appearance. Cell r_5 is closed and stalked, it is not predominantly reddish-brown and it lacks spots of white scales on the abdomen. Instead the head, legs and apex of the abdomen are orange, and contrast with the remainder of the body, which appears black owing to the presence of black hair and scales. The end of vein M_2 is not as strongly bent forward as in other species with r_5 closed, and the infuscated part of the wing is uniformly blackish, except for the pale spot in cell bm.

Description: Holotype ♂. Length, 16 mm, wing 18 mm. *Head*: Orange except for a small black spot between the bases of the antennae. All hair very short, bright orange; scales on occiput glossy orange. Eyes separated at vertex by about 4 x width of ocellar triangle; indentation shallow and bisecting line hardly evident. *Antennae*: Brown; hair on scape orange except at the apex where it is black like that on pedicel. First flagellomere equal in length to scape and pedicel combined, second as long as remainder of antenna. Proboscis 2 x length of head, black with labrum and palpi dark brown. *Thorax*: Black with scutellum and postpronotal lobes brown. Hair and scales on mesonotum black except for bright orange hair on anterior margin of mesonotum, propleura, upper part of anepimeron in front of wing and laterotergite. *Legs*: Coxae and trochanters black, femora and tibiae orange and tarsi blackish. Bristles and claws black. *Wing*: Cell r_5 closed and with a long stalk. Vein M_2 bent forward at end so that cell m_1 is about two thirds width of cell m_2 at margin of wing. End of infuscation in cell r_1 just beyond level of interradial crossvein then more or less straight across to near end of vein M_2. Clear middle area occupying middle third of discal cell, slightly narrowed on distal margin by infuscation in fore part of cell m_2, proximal margin straight to end of vein CuA1. An opaque whitish spot in cell bm. Squama blackish, fringe black. Stalk of halter black, knob grey. *Abdomen*: Black but sides of terga reddish and segments 6 to apex orange. Hair and scales on segments 1–5 black, 6 with some black scales, otherwise segments 6 to apex with glistening orange hair. Genitalia also orange with bright orange hair, not dissected.

Micomitra Bowden

Micomitra Bowden, 1964: 147. Type species: *Exoprosopa parvicellula* Bezzi, 1921, by original designation.

Comments: As noted above, the male and female genitalia of this genus resemble those of *Atrichochira*, and the two form a distinct clade along with the Australian genus *Pseudopenthes* Roberts (Lambkin 2001).

Keys: Palaearctic, Engel (1932–7), Paramonov (1928); Afrotropical, Bezzi (1924); southern Africa, Hesse (1956), all as *Exoprosopa*.

Hosts: Recorded as parasitic on Myrmeleontidae (du Merle 1975). No records from Africa.

Distribution: Afrotropical and Palaearctic Regions also India. North Africa: 2 species, *M. pharao* (Paramonov) (Egypt), *M. stupida* (Rossi) (Libya to Egypt). Africa South of the Sahara: 7 species. Aldabra: 1 species; *Micomitra famula* (Bezzi).

Pterobates Bezzi

Pterobates Bezzi, 1921*a*: 130 [1922*a*: 85; 1924: 273] (as subgenus of *Exoprosopa* Macquart). Type species: *Anthrax apicalis* Wiedemann, 1821, by monotypy.

Comments: *Pterobates* spp. have a striking appearance and are readily recognised by the iridescent black scales on the body, almost entirely infuscated wings, and long scales on the hind legs, which give them a feathered appearance. The species are also distinguished by having predominantly dark, blackish colouring.

Keys: Palaearctic, Engel (1932–7), Paramonov (1928), both as *Exoprosopa*.

Hosts: There are single records from a pompilid cocoon, a lepidopteran and a myrmeleontid (Yeates & Greathead 1997).

Distribution: Afrotropical, Palaearctic and Oriental Regions. North Africa: Egypt: 2 species; *Pterobates chalybaeus* (von Röder), *P. chrysogaster* (Bezzi). Africa South of the Sahara: Southern Africa: 1 species; *P. apicalis* (Wiedemann).

Prorostomatini Hull

Type genus: *Prorostoma* Hesse, 1956.

The tribe is characterised by Yeates (1994) as having a tumid face, eye with usually only a shallow indentation and without a bisecting line, basicosta without a spine-like basal hook (at most a small knob-like protrusion), vein R_{2+3} arising at a right angle proximal to the r-m crossvein, and mediotergite with hairs.

Conomyza Hesse

Conomyza Hesse, 1956: 114. Type species: *Conomyza semirufella* Hesse, 1956, by original designation.

Key: Hesse (1956).

Distribution: South Africa: 2 species; *Conomyza karooana* Hesse (Western Cape), *C. semirufella* Hesse (Northern Cape).

Coryprosopa Hesse

Coryprosopa Hesse, 1956: 118. Type species: *Coryprosopa lineata* Hesse, 1956, by original designation.

Distribution: Monotypic. Namibia, South Africa: Northern and Western Cape: *Coryprosopa lineata* Hesse.

Epacmoides Hesse

Epacmoides Hesse, 1956: 125. Type species: *Plesiocera biumbonata* Bezzi, 1922, by original designation.

Key: Hesse (1956).

Distribution: South Africa: Eastern, Northern and Western Cape: 5 species; *Epacmoides albifrons* Hesse, *E. biumbonatus* (Bezzi), *E. cryptochaunus* Hesse, *E. pallidulus* (Hesse), *E. xerophilum* Hesse.

Plesiocera Macquart

Plesiocera Macquart, 1840: 82 [1841: 360]. Type species: *Plesiocera algira* Macquart, 1840, by monotypy.
Calledax Hull, 1973: 338 (as subgenus of *Plesiocera* Macquart). Type species: *Plesiocera psammophila* Hesse, 1956, by original designation.

Comments: Yeates (1994) noted that the types species *Plesiocera algira* differs from the southern African species in possessing an indented eye margin and bisecting line. For this reason, Hull (1973) had proposed a new genus, *Calledax*, for the southern African species. Yeates (1994) considered that when the composition of the Prorostomatini is revised, *Calledax* will be revived and *Plesiocera* removed to another tribe. *Plesiocera ochracea* Greathead from Eritrea, Kenya and Arabia also lacks a bisecting line and would be included in *Calledax*.

Key: Southern Africa, Hesse (1956).

Distribution: Western Palaearctic and Afrotropical Regions. North Africa: Algeria, Tunisia: 1 species; *Plesiocera algira* Macquart. Africa South of the Sahara: 9 species.

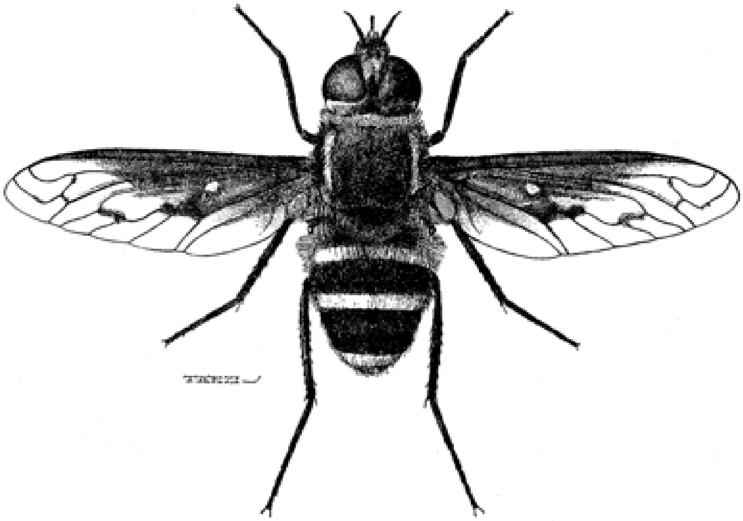
Prorostoma Hesse

Prorostoma Hesse, 1956: 121. Type-species: *Plesiocera integra* Bezzi, 1922, by original designation.

Distribution: Monotypic. South Africa: Eastern Cape: *Prorostoma integra* Hesse.

Stomylomyia Bigot

Stomylomyia Bigot, 1887*a*: xxxi [1887b: xxxi]. Type-species: *Stomylomyia leonina* Bigot, 1887 [= *Tomomyza europaea* Loew, 1869], by monotypy.



Figs 107. *Exoprosopa protuberans* Bezzi, male habitus (from Bezzi 1924).

Comments: *Stomylomyia* spp. are similar to *Plesiocera* spp. but have a interradial crossvein. The species examined also have an indication of a bisecting line, so their inclusion in this tribe needs to be reviewed.

Keys: Engel (1932–7), Paramonov (1929).

Distribution: Palaearctic Region. North Africa: Egypt: 4 species; *Stomylomyia aegyptiaca* Bezzi, *S. europaea* (Loew), *S. nigrirostris* Bezzi, *S. pusilla* Bezzi.

Villini Hull

Type genus: *Villa* Lioy, 1864.

The key character separating the Villini from the Exoprosopini is the absence of a spine-like pulvillus. Otherwise the two tribes are similar, except that the Villini most often lack an interradial vein (consequently only two submarginal cells), often have only a single flagellomere, and on the whole are smaller in size.

Until recently there was a tendency to lump species into the genera *Villa* and *Hemipenthes,* although other genera were proposed for distinctive species-groups, on the grounds that there was too much overlap in characters. However, examination of the genitalia and more subtle characters of the vestiture has enabled genera to be more convincingly delimited (Greathead 1981). Distribution patterns and host records tend to support the generic groupings recognised here and now generally accepted as valid.

Caecanthrax Greathead

Caecanthrax Greathead, 1980*a*: 322. Type species: *Anthrax inauratus* Klug, 1832, by subsequent designation (Evenhuis, 1991: 24). [Unavailable; genus-group name proposed after 1930 without type species designation.]

Caecanthrax Greathead, 1981: 324. Type species: *Anthrax inauratus* Klug, 1832, by original designation.

Comments: This genus has an Eremian distribution: It contains three striking *Exoprosopa*-like species with a dimidiate wing pattern, and contrasting black and gold or white scale patches on the abdomen. The two first to be recognised were described as *Anthrax* spp. and later placed in *Hemipenthes* or *Thyridanthrax*.

Distribution: Afrotropical and Palaearctic Regions. Mali to Somalia and Kenya, Socotra, Egypt: 1 species; *Caecanthrax inauratus* (Klug).

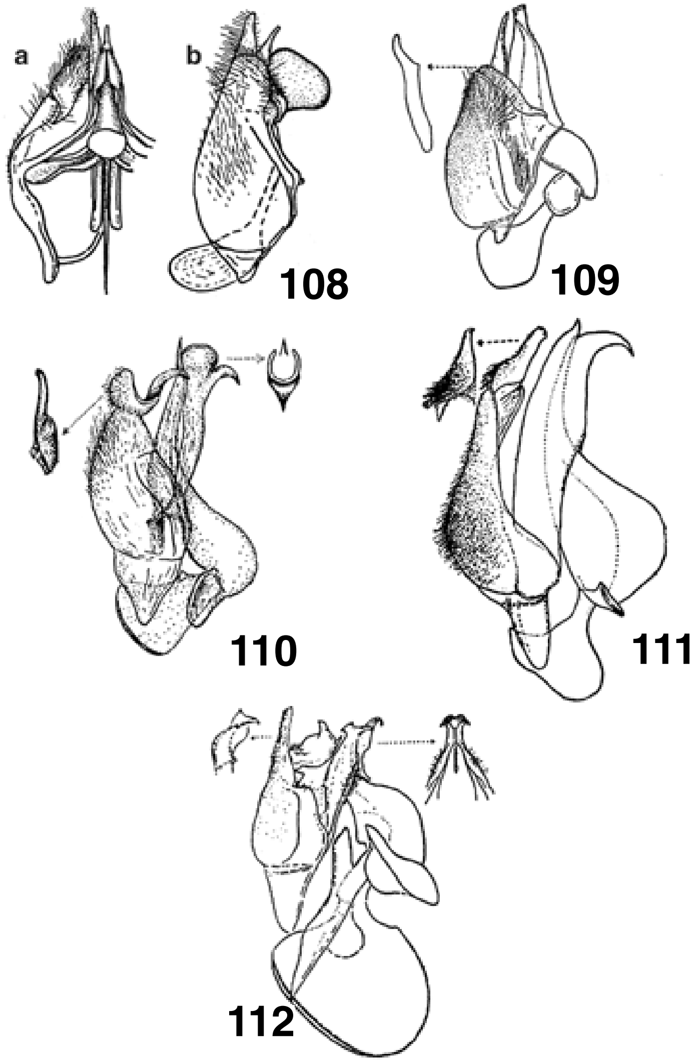
Exhyalanthrax Becker

Exhyalanthrax Becker, 1916: 44 (as subgenus of *Villa* Lioy). Type species: *Anthrax vagans* Loew, 1862 [= *Anthrax muscaria* Pallas, 1818], by subsequent designation (Bezzi, 1924: 7, 192).

Oriellus Hull, 1973: 403 (as subgenus of *Thyridanthrax* Osten Sacken). Type species: *Anthrax stigmulus* Klug, 1832, by original designation.

Tauropsis Hull, 1973: 365, 368 (as subgenus of *Thyridanthrax* Osten Sacken). Type species: *Anthrax irrorellus* Klug, 1832, by original designation.

Comments: The numerous species of this genus have a characteristic appearance and formed Hesse's (1956) *Thyridanthrax* Group 1. He had shown that some species have sexually dimorphic wing infuscations and, most notably, that *lineus* Loew with hyaline wings was the male of *abruptus* Loew with a dark basicostal infuscation. This provided the basis for acceptance of *Exhyalanthrax* Becker (proposed for species with hyaline wings) by Bowden (1980) for Hesse's Group 1 species.



Figs 108–112. Bombyliidae male genitalia. 108. *Parisus aurantiacus* (Macquart). a. ventral view. b. lateral view (from Hesse 1938). 109. *Desmatoneura meridionalis* (Hesse). 110. *Xeramoeba apricaria* Hesse. 111. *Anthrax pithecius* Fabricius. 112. *Anthrax aygulus* Fabricius (all from Hesse 1956).

Keys: Palaearctic, Engel (1932–7); Afrotropical, Bezzi, (1924); Eritrea/northern Ethiopia, Greathead (1967); southern Africa, Hesse (1956); West Africa, Bowden (1964), all as *Thyridanthrax*.

Hosts: Commonly reared as parasitoids in the pupae of *Glossina* spp. and other dipterous puparia, also reared from the parasitoids and hosts of parasitic Diptera and Hymenoptera (du Merle 1975; Greathead 1980*c*; Yeates & Greathead 1997).

Distribution: Afrotropical, Palaearctic and Oriental Regions. North Africa: 8 species. Canary Islands: 2 species; *Exhyalanthrax canarionae* Báez, *E. simonae* (François). Africa South of the Sahara: about 37 species. Socotra: 2 species; *E. alatus* (Becker), *E. argentifrons* (Becker).

Hemipenthes Loew

Hemipenthes Loew, 1869*c*: 27 [1872*b*: 141]. Type species: *Musca morio* Linnaeus, 1758, by subsequent designation (Coquillett, 1894: 90).

Isopenthes Osten Sacken, 1886: 80, 96. Type species: *Isopenthes jaennickeana* Osten Sacken, 1886, by subsequent designation (Coquillett, 1910: 556).

Comments: *Hemipenthes* spp. are *Villa*-like in external morphology (face not produced, single onion-shaped flagellomere), but are *Anthrax*-like in appearance and colour.

Keys: Palaearctic, Engel (1932–7).

Hosts: Parasitoids of the dipterous and hymenopterous parasitoids of Lepidoptera and Diprionidae and their hosts (du Merle 1975; Yeates & Greathead 1997). No records from Africa.

Distribution: Mainly Holarctic and Neotropical Regions. North Africa: 3 species; *Hemipenthes morio* (Linnaeus) (Morocco), *H. pauper* (Becker) (Algeria, Egypt), *H. velutina* (Wiedemann) (Algeria, Tunisia, Egypt). Africa South of the Sahara: Ethiopia: 1 species; *H. ethiops* Greathead.

Laminanthrax Greathead

Laminanthrax Greathead, 1967: 251. Type species: *Laminanthrax albus* Greathead, 1967 [= *Thyridanthrax chionophorus* Bezzi, 1925], by original designation.

Comments: *Laminanthrax* is the most plesiomorphic genus in the Villini, and has well developed normal pulvilli unlike other genera included in the tribe (except *Synthesia*).

Distribution: South-west Palaearctic and north-east Africa. Egypt, Eritrea, Ethiopia: 1 species; *Laminanthrax chionophorus* (Bezzi).

Marleyimyia Hesse

Marleyimyia Hesse, 1956: 521, Type species: *Marleyimyia natalensis* Hesse, 1956, by original designation.

Comments: *Marleyimyia* was proposed by Hesse (1956) for a new South African species with reduced mouthparts, reared from a cossid pupa, which did not correspond with *Oestranthrax* or *Villoestrus*. Subsequently, a second species was described from Malaysia, also reared from a cossid host.

Hosts: Reared from the pupae of Cossidae (Hesse 1956; du Merle 1975).

Distribution: South Africa and Malaysia. Africa South of the Sahara: KwaZulu-Natal: 1 species; *Marleyimyia natalensis* Hesse.

Oestranthrax Bezzi

Oestranthrax Bezzi, 1921*a*: 130, 172 [1923: 326]. Type species: *Anthrax obesa* Loew, 1863, by original designation.

Comments: *Oestranthrax* spp. adults are seldom collected, presumably because, being unable to feed, their life is short. However, like the other genera of Villini with vestigial mouthparts, the adults contain an unusual amount of fat, and dried specimens tend to become ‘greasy’.

Key: South and East Africa, Hesse (1956).

Hosts: One record as a parasitoid of Myrmeleontidae in Greece (Yeates & Greathead 1997).

Distribution: Afrotropical and Holarctic Regions. North Africa: 3 species; *Oestranthrax alfierii* Paramonov (Egypt), *O. brunnescens* (Loew) (Egypt), *O. pallifrons* Bezzi (Libya). Africa South of the Sahara: 4 species, *O. disparilis* Hesse (KwaZulu-Natal), *O. obesus* (Loew) (Namibia-Zambia), *O. pix* Speiser (Tanzania), *O. speiserianus* Bezzi (Kenya).

Pachyanthrax François

Pachyanthrax François, 1964*b*: 929. Type species: *Pachyanthrax villiersi* François, 1964, by original designation.

Comments: After *Pachyanthrax* had been described for a new species from Senegal, it became apparent that certain anomalous species that had been placed in *Thyridanthrax*, *Villa* or *Exoprosopa*, belonged to this genus. The species are broad-bodied and have an *Exoprosopa*-like vestiture.

Keys: Palaearctic, Engel (1932–7); Afrotropical, Bezzi (1924), both as *Thyridanthrax*.
Distribution: Afrotropical and Palaearctic Regions. North Africa: 3 species; *Pachyanthrax albosegmentatus* (Engel) (Egypt), *P. circe* (Klug) (Egypt), *P. nomadorum* (Greathead) (Morocco). Africa South of the Sahara: 5 species; *P. cunamae* (Greathead) (Eritrea, Kenya), *P. lutulentus* (Bezzi) (Botswana, Namibia), *P. nomadorum* (Nigeria, Mauritania), *P vetulus* (Wiedemann) (Eritrea, Sudan), *P. villiersi* François (Niger, Senegal).

Synthesia Bezzi

Synthesia Bezzi, 1921*a*: 130. Type species: *Synthesia fucoides* Bezzi, 1921, by original designation.

Comments: This monotypic genus has normal developed pulvilli, the eyes lack a bisecting line, and other plesiomorphic characters are present.

Distribution: Monotypic. South Africa: Northern Cape: *Synthesia fucoides* Bezzi.

Thyridanthrax Osten Sacken

Thyridanthrax Osten Sacken, 1886*b*: 113 (as subgenus of *Anthrax* Scopoli), 123 (as 'group' of *Anthrax* Scopoli). Type species: *Anthrax selene* Osten Sacken, 1886, by subsequent designation (Coquillett, 1910: 615).

Comments: The genus *Thyridanthrax* is currently restricted to those species with hyaline areas within the infuscated part of the wing (fenestrate pattern); Hesse's (1956) Group 2.

Keys: Palaearctic, Engel (1932–7); Afrotropical, Bezzi, (1924), Greathead (1991*a*); Eritrea/northern Ethiopia, Greathead (1967); southern Africa, Hesse (1956); West Africa, Bowden (1964).

Hosts: Reared from cocoons of Sphecidae, pupae of Noctuidae and Tenebrionidae, and egg-pods of Acrididae (du Merle 1975; Yeates & Greathead 1997).

Distribution: Afrotropical, Holarctic and Neotropical Regions. North Africa: 9 species. Canary Islands: 1 species; *Thyridanthrax indigenus* (Becker). Africa South of the Sahara: 7 species.

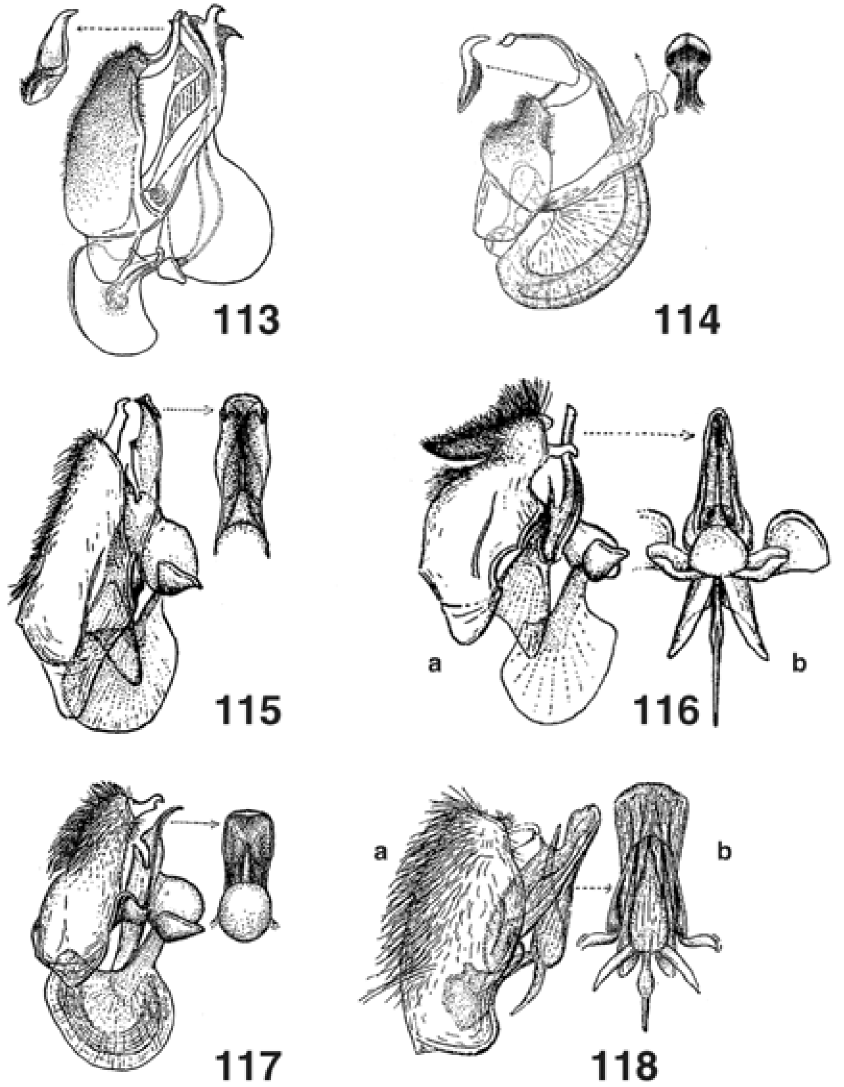
Veribubo Evenhuis

Tumulus Hull, 1973: 403, 404 (as subgenus of *Thyridanthrax* Osten Sacken). Type species: *Anthrax misellus* Loew, 1869, by original designation. [Preoccupied by Monterosato, 1888.]

Veribubo Evenhuis, 1978*b*: 247 (new replacement name for *Tumulus* Hull, 1973). Type species: *Anthrax misellus* Loew, 1869, automatic.

Comments: This genus was proposed by Hull (1973) (as *Thyridanthrax* subgenus *Tumulus*, but unfortunately this name is preoccupied) for species with a single robust flagellomere. In contrast to *Exhyalanthrax* spp., the males tend to have more developed wing patterns than females. The species now allocated to it indicate an Eremian distribution for the genus.

Keys: Palaearctic, Engel (1932–7); Eritrea/northern Ethiopia, Greathead (1967) both as *Thyridanthrax*.



Figs 113–118. Bombyliidae male genitalia. 113. *Spogostylum incisurale* (Macquart). 114. *Spogostylum punctipenne* (Wiedemann). 115. *Exhyalanthrax abruptus* (Loew). 116. *Pachyanthrax lutulentus* (Bezzi) a. lateral view. b. ventral view. 117. *Thyridanthrax perspicillaris* (Loew). 118. *Heteralonia umbrosa* (Loew) (all from Hesse 1956).

Distribution: Eremian Region. North Africa: 6 species. Africa South of the Sahara: 5 species; *Veribubo anus* (Wiedemann) (Sudan), *V. capella* (Greathead) (Eritrea, ?Mali), *V. gazella* Greathead (Mali), *V. latonus* (Wiedemann) (Sudan), *V. pallescens* (Greathead) (Chad).

Villa Lioy

Villa Lioy, 1864: 732. Type species: *Anthrax concinna* Meigen, 1820 [= *Anthrax abbadon* Fabricius, 1794], by subsequent designation (Coquillett, 1910: 619).

Aspiloptera Künckel d'Herculais, 1905: 145. Type species: *Anthrax flavus* Meigen, 1820 [= *Musca hottentotta* Linnaeus, 1758], by monotypy.

Comments: *Villa* is a large, cosmopolitan genus of mostly very similar looking species, some of which can only reliably be separated by differences in the genitalia.

Keys: Palaearctic, Engel (1932–7); Afrotropical, Bezzi, (1924); Eritrea/northern Ethiopia, Greathead (1967); southern Africa, Hesse (1956). *Villa cingulata-paniscus* group, François (1969).

Hosts: Internal parasitoids of the pupae of Lepidoptera, Tabanidae and Myrmeleontidae (du Merle 1975; Yeates & Greathead 1997).

Distribution: Cosmopolitan. North Africa: 13 species. Canary Islands: 3 species; *Villa. albiventris* Frey, *V. nigriceps* (Macquart), *V. nigrifrons* (Macquart). Africa South of the Sahara: 43 species. Aldabra: 1 species; *V. aldabrae* Greathead. Cape Verde Islands: 2 species; *V. bravae* Bezzi, *V. phaeotaenia* Bezzi. Socotra: 1 species; *V. dioscoridae* Greathead. Madagascar and the Mascarene Islands: 1 species; *V. unifasciata* Macquart.

Villoestrus Paramonov

Villoestrus Paramonov, 1931: 93. Type species: *Villoestrus uvarovi* Paramonov, 1931, by monotypy.

Comments: This genus has the most reduced mouthparts among the three genera of Villini with non-functional mouthparts.

Distribution: Afrotropical and Palaearctic Regions but not known from North Africa. Africa South of the Sahara: South Africa: 1 species; *Villoestrus dimorphus* Hesse.

Xeramoebini Hull

Type genus: *Xeramoeba* Hesse, 1956.

The tribe Xeramoebini was proposed by Hull (1973) for genera with the face not produced, vein R_{2+3} arising at a right-angle before or opposite crossvein r-m, and also metepisternum and mediotergite bare.

Desmatoneura Williston

Desmatoneura Williston, 1895: 267. Type species: *Desmatoneura argentifrons* Williston, 1895, by monotypy.
Chionamoeba Sack, 1909: 510, 543. Type species: *Bibio nivea* Rossi, 1790, by original designation.
Chiasmella Bezzi, 1924: 156. Type species: *Chiasmella brevipennis* Bezzi, 1924, by original designation.

Comments: François (1967) demonstrated that the genus *Chionamoeba* is a synonym of the American *Desmatoneura*, and Greathead (1988*b*) found that *Chiasmella* is also a synonym. The generic identity of species is readily confirmed by the large, conical phallosome lacking a separate epiphallus, and by the tumid frons, unlike other genera with a similar habitus, e.g. species of *Xeramoeba* Hesse.

Key: Palaearctic, Engel (1932–7) as *Chionamoeba*.

Distribution: Nearctic, Palaearctic, Afrotropical and Oriental Regions. North Africa: 4 species; *Desmatoneura. albifacies* (Macquart) (Algeria, Egypt), *D. flavifrons* (Becker) (Tunisia), *D. nivea* (Rossi) (Egypt, Tunisia), *D. sardoa* (Macquart) (Algeria). Africa South of the Sahara: 6 species, including Socotra: 1 species; *D. sica* Greathead.

Petrorossia Bezzi

Petrorossia Bezzi, 1908: 35. Type species: *Bibio hesperus* Rossi, 1790, by original designation

Comments: Species are difficult to characterise, and the significance of the considerable variation in details of the male genitalia has not been resolved. Thus, there may be more or fewer species than those presently recognised.

Keys: Palaearctic, Engel (1932–7); Afrotropical, Bezzi (1924); southern Africa, Hesse (1956); West Africa, Bowden (1964).

Hosts: There is no clear indication of host preferences for this genus. Species have been reared from the puparia of *Glossina* spp., cocoons of Tiphiidae, solitary bees and wasps, and one from the egg-mass of a spider (du Merle 1975; Yeates & Greathead 1997).

Distribution: Old World. North Africa: 6 species, including Canary Islands: 1 species; *P. guanchorum* Francois. Africa South of the Sahara: 25 species, including Socotra: 1 species; *P. sokotrae* (Ricardo).

Pipunculopsis Bezzi

Pipunculopsis Bezzi, 1925: 210, 211. Type species: *Pipunculopsis bivittata* Bezzi, 1925, by original designation.

Comments: This monotypic genus is very similar in appearance to *Petrorossia*, but has strikingly different male genitalia.

Distribution: Monotypic. Egypt, Sudan: *Pipunculopsis bivittata* Bezzi.

Prothaplocnemis Bezzi

Prothaplocnemis Bezzi, 1925: 218, 220. Type species: *Argyromoeba anthracina* Becker, 1902 (as '*Argyramoeba*'), by original designation.

Comments: This monotypic genus is very similar to *Xeramoeba*, but differs from it most strikingly in having shining black cuticle and patches of white hair and scales.

Distribution: Monotypic. Egypt: *Prothaplocnemis anthracina* (Becker).

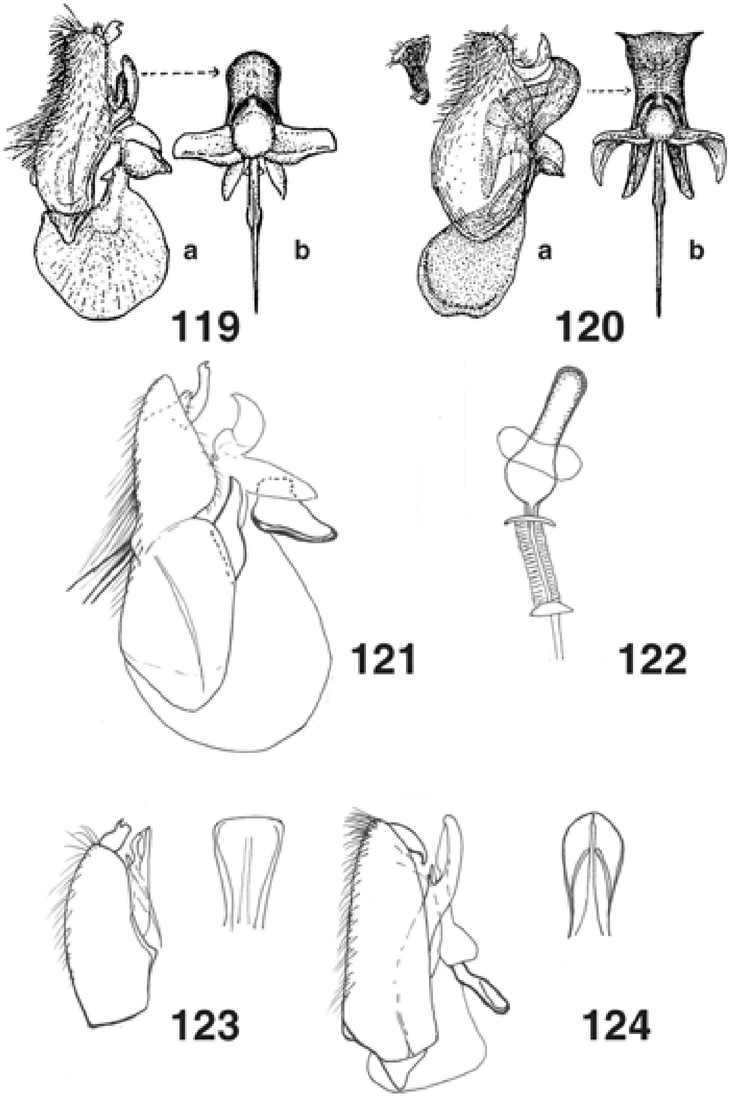
Xeramoeba Hesse

Xeramoeba Hesse, 1956: 356. Type species: *Xeramoeba apricaria* Hesse, 1956, by original designation.

Comments: The genus was described by Hesse (1956) for a new South African species, *X. apricaria* Hesse, near *Prothaplocnemis*. Subsequently, other African species have been described and several Palaearctic species transferred to it from the Anthracini and from *Desmatoneura*.

Keys: Palaearctic, Engel (1932–7) as *Anthrax* or *Chionamoeba*; also, Paramonov (1935) as *Anthrax*.

Hosts: *Xeramoeba oophaga* (Zakhvatkin) is well known as a predator of the eggs of



Figs 119–124. Bombyliidae genitalia. 119. *Exoprosopa argentifrons* Macquart, male genitalia. *a*. lateral view. *b*. ventral view. 120. *Micomitra vitripennis* (Brunetti), male genitalia. *a*. lateral view. *b*. ventral view (all from Hesse 1956). 121. *Exoprosopa engima* Greathead and Evenhuis sp. n., male genitalia 122. *Exoprosopa enigma* Greathead and Evenhuis sp. n., female spermatheca. 123. *Heteralonia azaniae* Greathead and Evenhuis sp. n., male genitalia. 124. *Diatropomma annettae* Greathead and Evenhuis sp. n., male genitalia.

Acrididae, but another species, *X. infuscata* Greathead, was reared from the pupa of a noctuid moth (Greathead 1963; du Merle 1975).

Distribution: Southern Palaearctic and Afrotropical Regions. North Africa: 4 species; *Xeramoeba. ramsesi* (Paramonov) (Egypt), *X. rubicunda* (Bezzi) (Egypt), *X. sabulonis* (Becker) (Algeria, Egypt, Tunisia), *X. semirufa* (Sack) (Egypt). Africa South of the Sahara: 7 species.

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